

AMERICAN BUILDER

Including "BUILDING DEVELOPER" and "HOME BUILDING"

A SIMMONS-BOARDMAN PUBLICATION

Vol. 48

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Car Builder's Cyclopedia	Locomotive Cyclopedia

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AMERICAN BUILDER



Including "Building Developer" and "Home Building"

BERNARD L. JOHNSON and CHARLES G. PEKER, Editors

105 West Adams St., Chicago—30 Church St., New York City

Financing Wanted . . .

—An Editorial

LAST month AMERICAN BUILDER called on the men of this industry for more salesmanship—more aggressive, creative selling of home building and home improvements. They have the finest thing in the world for sale, and the great American buying public must be made to appreciate it at its true worth.

However, there are obstacles, as we all know. The biggest of these right now is *financial*. High priced money, or no money at all, for building purposes has been the complaint from many quarters. Typical of this, we present a letter from a Wisconsin subscriber.

"Has the Financial Department of your paper found out the reason for this shortage of money for construction? Why are the Building and Loan Associations closing down on loans? Is it really the big demand for call money that has caused this condition?—and how long before we can expect a readjustment of things?

"I speak of the conditions in Milwaukee and want to add that it cannot help but bring about an endless hardship on the home builders and material men in the business. Its effect is bound to create a very disastrous outcome, if this condition is general throughout the country, or a big part of it."

FOLLOWING the stock market slump of last week, the newspaper financial writers are predicting lower interest rates in the call money market. An increased demand for bonds is also forecast. If these conditions come they will, of course, help the mortgage money situation. Still, there is more basic help that the building industry might well receive from the bankers.

Axel Lonnquist, prominent builder and developer of Chicago, points out a grave defect, as he sees it, in the Federal Reserve Act, discriminating against the builder as a manufacturer. In a letter to the AMERICAN BUILDER he says:

"As I interpret the Federal Reserve Banking law only farmers' loans or so-called commercial credit loans are rediscountable by member banks in the Federal Reserve Bank. Consequently, collateral loans secured by first mortgages or properly safeguarded first mortgage bonds or other such securities are today frozen loans or loans that the banks with sufficient resources are rejecting, irrespective of the influence it has upon the building business or the development of a community of allied business.

"Why this discrimination against collateral loans by the Federal Reserve Bank law? The Federal Reserve Banks rediscount commercial loans based on more automobiles, more shoes, etc. Why should there be discrimination against new building development or any other line of honest human endeavor? Why should we be told that automobile manufacturers shall do as they please but so restrict credit by vicious handicaps that *new models in homes or buildings* can get no credit? Why make fish of one and fowl of the other, under the Federal Reserve Banking law?

"Why shouldn't the security itself be the final basis upon which loans be approved or disapproved or rediscountable at the Federal Reserve Banks? Either restrict them all, or none. Why make an exception of good mortgage securities?"

SUCH questioning is reasonable, at least so it seems to the AMERICAN BUILDER. Manufacturers are being aided by organized finance. The farmers are in the process of being relieved by special legislation and a well financed Board with broad powers. Yet here is the building industry, second only to agriculture in the number employed and value of product, seriously hampered for lack of adequate financing machinery.

It has always been assumed that a mortgage on improved real estate, being the very best form of security, needs no assistance. Perhaps formerly that was true; but not today. Mortgages and mortgage bonds have to be sold to the investing public; and, with the market sentiment as it has been the past year or so, the cost of this selling is too high.

That the bankers themselves are awake to these problems is indicated by the fact that they have made an extensive survey of what it costs bankers to negotiate mortgages; and the results of this survey will be a feature of the annual convention of the Mortgage Bankers Association of America that will open October 29 at the Roosevelt Hotel, New Orleans.

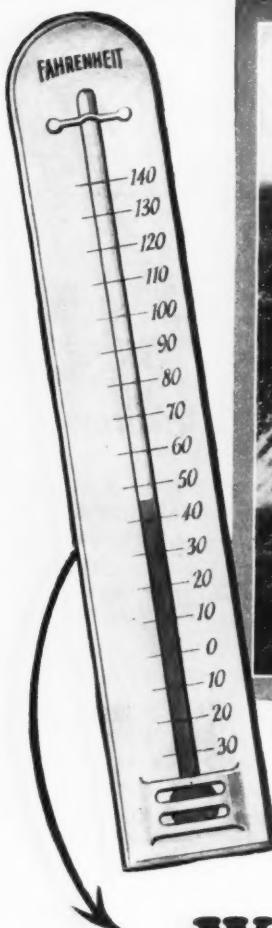
THESE are basic financing problems, underlying the entire building structure. As an industry we must see that they are analyzed sanely and solved in a lasting way. Some definite suggestions regarding this matter will be offered in the columns of the AMERICAN BUILDER in its next issue and in later issues.

New Standards to Bring Activity

THE total volume of contracts awarded in the United States during the month of September amounted to \$489,942,530, according to published contract figures plus an allowance for unreported territory. This was a loss of 24 per cent from the total for September of last year. Contracts awarded during the first nine months of this year showed a decrease of 10 per cent from the corresponding period of 1928.

The idea has been expressed that a shortage of residential construction, which formerly existed, has now been overcome and that the residential construction volume has now returned to a lower and normal level. This theory is refuted by certain facts which are too often overlooked. On the basis of former standards the reduced rate of residential construction would be normal. New standards have been established, however, and many existing buildings are now obsolete if not completely uninhabitable. This fact has established normal residential construction at a higher level than that which prevailed prior to 1929.

This fact is substantiated by the report of the State Board of Housing of New York, dated March 6, 1929,



Protecting a pavement placed in late autumn, near Gary, Ind.

When a Cold Snap Threatens, Use High-Early-Strength Universal Concrete

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Description of methods for obtaining high-early-strength concrete with the same Universal cement used for regular work, together with a booklet on cold-weather concreting, will be sent on request. In addition to following carefully these methods, it is always desirable that strength tests be made on concrete placed in cold weather. Just use the coupon.



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Subsidiary of United States Steel Corporation

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence

FOR ADVERTISERS' INDEX SEE NEXT TO LAST PAGE

*The Sundial—
an ancient symbol
and a modern ornament.*



Fashions change and new problems face the Building Industry—yet, changeless as time, the old fact of contractor-builder responsibility still controls the selection, purchase and installation of every item of building material, equipment and finish.

which includes a review of housing conditions in New York City and Buffalo and a preliminary study of the smaller cities and first class villages of New York state.

According to this report, building was carried on actively throughout the year in New York City, with the result that there was a steady increase in the number of vacant apartments. A striking fact, however, is that the vacancies are found largely among the buildings having the lowest rentals. "More than 11,000 of the vacant apartments are offered at rentals below \$4 per room per month. Nearly 49,000, or close to one-half, of all the vacancies are below \$8 per room per month." These low rentals are found, without exception, in the old-law buildings, and are often asked for apartments absolutely unfit for habitation. Of those vacated since 1921, about 39,000 have been demolished, but nevertheless a population of more than 1,700,000 persons is still housed in old-law buildings.

"Most of these are structurally inadequate and can not be altered so as to meet even the most modest of

modern standards; and yet, unless the present rate of evacuation is materially accelerated, many of the old-law tenements will still be in use 30 to 50 years from now. It would appear, then, that although present conditions in New York City make a tremendous improvement over the situation existing at the beginning of the decade, the housing problem for a large portion of the population is still serious." The preliminary study in the smaller cities and first-class villages brought out the fact that bad housing is more widespread than is generally recognized. "Some of the worst housing conditions are commonly found in the smaller cities and even the villages."

With business in general forging ahead at a rate never before known, with high wages and steady employment, the demand for suitable, modern housing is bound to make itself felt again in spite of the influences which have caused a temporary decline in residential construction. The suppressed demand will reassert itself.

The Growth of American Business, 1904 to 1929

Figures Compiled by HORNBLOWER & WEEKS

	1904	1914	1929 (Estimate)
Wealth of United States (Estimated).....	\$107,104,000,000	\$185,000,000,000	\$500,000,000,000
Income of United States (Estimated).....	18,000,000,000	33,000,000,000	115,000,000,000
National Bank Deposits.....	3,312,439,000	6,268,692,000	24,000,000,000
State Bank Deposits.....	2,073,218,000	3,226,793,000	13,000,000,000
Trust Company Deposits.....	1,600,322,000	3,939,807,000	11,000,000,000
Total Deposits in Commercial Banks.....	\$6,985,979,000	\$13,435,292,000	\$48,000,000,000
Savings Bank Deposits.....	3,060,178,611	4,936,591,849	10,200,000,000
Savings Deposits in All Banks*.....	Not available	6,400,411,041	29,000,000,000
Bank Clearings.....	\$112,449,664,000	\$163,849,811,000	\$600,000,000,000
Railroad Gross.....	\$1,975,174,000	\$3,127,729,000	\$7,300,000,000
Railroad Net.....	579,476,000	674,190,000	1,700,000,000
Wheat Crop (Bushels).....	552,399,517	891,017,000	774,000,000
Corn Crop (Bushels).....	2,467,480,933	2,672,804,000	2,740,000,000
Cotton Crop (Bales).....	12,750,000	16,134,930	15,543,000
Pig Iron Production (Tons).....	16,500,000	23,332,244	45,000,000
Copper Production (Pounds).....	780,800,000	1,150,136,960	2,200,000,000
Value of Manufactured Products.....	\$14,793,902,563	\$24,246,434,724	\$70,000,000,000
Foreign Trade.....	\$2,451,914,000	\$4,258,504,000	\$11,000,000,000
Market Value Securities.....	Not available	\$27,394,627,000 (Par Value) 1,009,752,000 (October, 1918)	\$123,000,000,000 (July 31, 1929) 8,549,384,000 (Sept. 30, 1929)
New York Stock Exchange.....	Not available	47,900,568† (1910)	1,000,000,000 122,000,000
Brokers' Loans, New York Stock Exchange..	187,313,065	91,972,266	
Share Sales, New York Stock Exchange.....	75,994,575 (1900)	21,565,652,000 (1910)	\$100,000,000,000
Population		\$2,606,000,000	\$7,500,000,000
Life Insurance in Force.....	\$12,547,937,000		
Building Contracts.....	\$1,893,000,000		

* Includes deposits in savings banks and in savings departments of national and state banks and trust companies, all of which items are included in preceding figures.

† Stock Exchange trading suspended from July 31 to December 11, 1914. Sales in 1915 were 173,145,203 shares.

A Distinctive American Architecture

By LOUIS LA BEAUME

Director American Institute of Architects



CHICAGO'S towers and Manhattan's cliffs of masonry are the forerunners of a distinctive American architecture.

America has finished that period of its history when it was not only a melting pot for many races but a museum of the architecture of many lands. If many races have been fused in the making of America, the architecture of many races has been transplanted, if not fused, to safeguard the American citizen against homesickness for the scenes of his ancestors.

Greece, Rome, the Italy of the Medicis, the France of every dynasty from Charlemagne to Poincare, the England of 800 years from William the Conqueror to George IV, the Spain of the Moors, of Ferdinand and Isabella, and the four Philips, have been copied.

A diligent student may make the grand tour of Europe and familiarize himself with the culture of a dozen races throughout a period of 2,000 years without a passport, without even a twinge of seasickness.

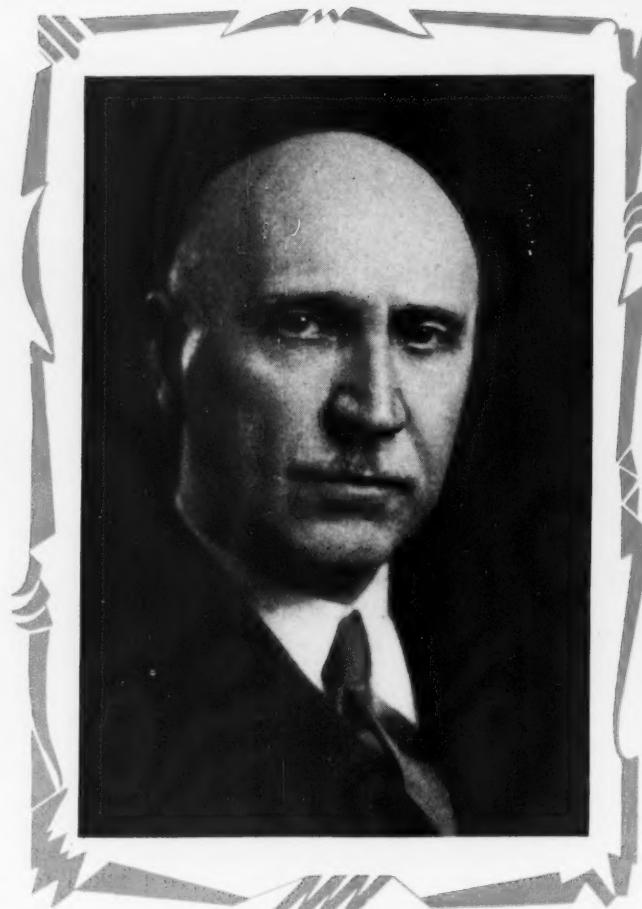
This is the architecture of America, but what of American architecture? What do our flattering critics mean when they proclaim that we lead the world in this most vital of all the arts? Do they mean that our Georgian houses are better than Georgian houses ever were, that our Normandy manors are more redolent of Normandy, our Cotswold cottages more utterly charming, or our Spanish farm houses more typically Spanish than their prototypes?

No, they cannot mean this. They must mean something else. Our Gothic churches cannot be better than the Gothic of the Isle de France, our temples, or rather our templed memorials, or counting houses, cannot exceed the perfection of the Parthenon.

They must see in our factories, in our skyscrapers, something they have never seen before, something that has suffered a sea change, and taken on the aspect of its environment. They must mean our Chicago towers, and Manhattan's pinnacles and cliffs of masonry.

We know that vastness and bulk, volume and height are attributes to conjure with. We know that these things cause the beholder to draw his breath, almost make his reason totter. We have had some practice in managing them which less prosperous, less dauntless people have not enjoyed.

And yet in the very handling of these American masses are we not still straining our eyes toward



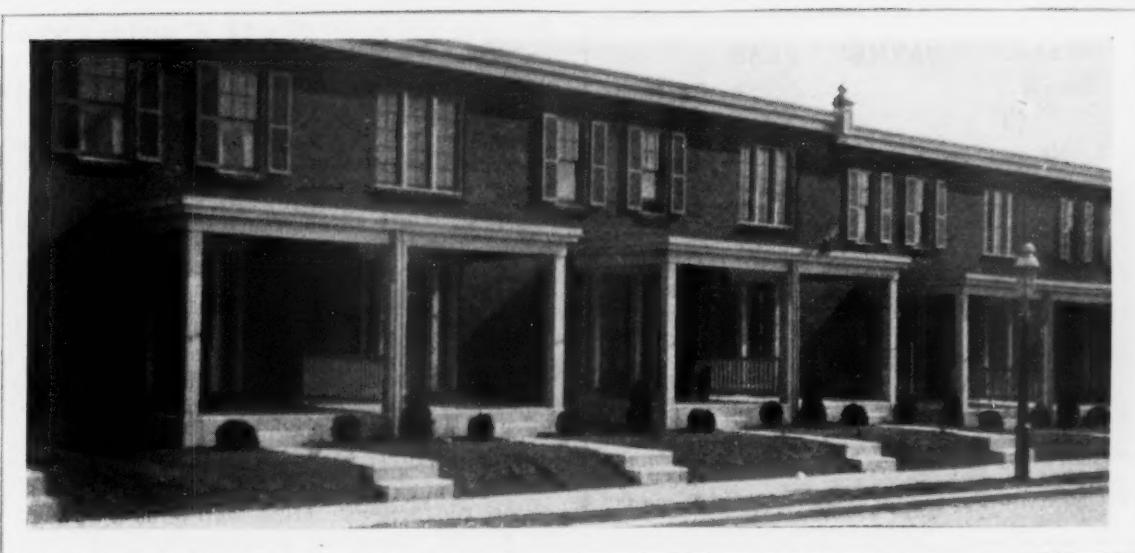
Europe for suggestion? We talk now of modernism, we speak with disdain of the past yesterday; and there is health in this; but let us be humble for a while yet, until we can be quite sure that the modernism we strive for is inherent in our own character. To borrow it from Sweden, from Germany, from Holland or from France would be but to continue our incorrigible habits of plagiarism.

As moderns, we need offer no apology for being modern. It may be our misfortune, but it can hardly be said to be our fault. We were born too late to be anything else, and it is really to our credit that we are more willing each day to admit the dreadful fact. We share our modernism too with our contemporaries the world over.

If our old stodgy habits are changing, if we are beginning to detect a new crispness and terseness a new simplicity and directness in the design of our little buildings as well as our big ones, we may seek for the cause in two factors. First, we are living in a crisper, speedier, smarter time, and second, client and architect are more nearly one and the same than they ever were before.

The young architect of today feels and reflects the tempo of his generation. As in dress, for instance, and feminine dress particularly, yards and yards of hampering fabric which an outworn tradition had sanctified, have been stripped off; as manners and music, and even morals are tending more to the point each decade, each year almost, so our architecture is stripping itself of much of the historic impedimenta which clogs and hampers its natural purpose.

Climate and war and the worship of God, trade and the lust of gold, the struggle for power, the struggle for liberty, and fire, these things have all affected the architectural panorama.



HOMES for \$1 a DAY

*What the Rest of the Country Can Learn
from Philadelphia*

HOUSING in Philadelphia for almost 300 years has spread over the land. We keep our feet on the ground, neither burrow underneath, nor wall ourselves away from the sunlight in gloomy rooms, nor aspire to the realms of the smokestacks. Mistakes have been made in the allotment of yard areas, but these have been checked. The lure of perpendicular heights has not been generally felt. Over eighty per cent of our families live in single dwellings and although some families today are a little too susceptible to the call of the apartment, yet we still continue to erect small houses and strive to bring them down to the economic reach of the average family budget, exalting the ideal of the individual home, with its privacy, sunlight and ventilation.

Philadelphia has not as yet gone up in the air to house the major part of its population. In no one year in its history has it erected as many as 100 buildings of this type. It still adheres to the small dwelling as the mode in its housing.

Perhaps this may best be illustrated in a comparative statement of housing types. The City Assessor's list for 1928 credits Philadelphia with 415,045 buildings of all kinds used in whole or in part for human habitation. The Division of Housing and Sanitation has a record

By **BERNARD J. NEWMAN**

*Managing Director, Philadelphia
Housing Association*

of 9,654 multiple houses listed. This figure is probably incomplete, but there are still over 400,000 one-family dwellings in Philadelphia.

The converted dwelling type of tenement is rarely over three stories high and does not average over five families per building, so that even in such type of occupancy Philadelphia has not accepted the barrack-like structure so common in tenement cities.

During the past six years the dwelling construction program within the city has recorded 57,202 houses under construction permit, of which only 490 were tenements and 413, two-family houses. The total family accommodations provided for was 69,953, of which 12,828 were in multiple buildings, or 18.3% of the total. It is apparent that Philadelphia demonstrates the practicality of the one-family dwelling even in a city of over 2,000,000 population.

The home seeker in Philadelphia, whose annual income is \$1,800 and over, can find a wide choice of newly built houses of attractive layout and well equipped at sales prices beginning as low as \$4,000, or \$800 per room. The lowest priced houses built in any considerable sized operation last year are being marketed at \$3,990.00. They are sold on a cash payment of \$490.00 and with a monthly carrying charge of \$30.40 (one dollar a day),



Purchase Price of These Houses Is
\$3,990, Carrying Charges \$30.40 Per
Month. Charles Maguire is the builder.

A SAMPLE PAYMENT PLAN

Purchase Price.....	\$4,500.00
Payment on Account.....	<u>750.00</u>
Leaving a Balance of.....	\$3,750.00
Which can be made up in two mortgages, a Straight Mortgage of.....	\$2,000.00
And a Second Building and Loan Mortgage of	<u>1,750.00</u>
 Monthly Payments	
Interest on First Mortgage, per month.....	\$ 10.00
Building and Loan Payment, per month.....	19.63
Taxes and Water Rent (estimated assessment, \$3,000.00)	7.78
Total Monthly Expenditure.....	\$ 37.41
Out of which is saved in Building and Loan Association	8.75
Total Net Monthly Expense of.....	\$ 28.66

of which \$5.00 is credited to the amortization of the second mortgage.

These brick dwellings are 14' 8" x 26', built on lots 75' depth, with set-backs of 15' from the street line. They contain five rooms, have hot water heating, gas range, electric fixtures, floor plugs, standard plumbing, hardwood floors, twin cement porches, and guaranteed roofing and are within walking distance of twenty industries.

In a higher priced home of \$5,100.00 the home buyer may secure six rooms in a house 16' 6" x 36', on a lot 16' 8" x 70'. Such a home has attractions which a few years ago could not be found in dwellings costing several thousand dollars more in price. It has hardwood floors in all rooms except the kitchen, breakfast room and bathroom, which have instead inlaid linoleum, cemented on felt. Moreover, it has tiled bathroom, built-in tub and shower, standard plumbing fixtures with apron front sink, hot water heater, electric fixtures, large closets, heated basement, garage, cement open plaza, deep terrace and shrubbery and other devices and attractions to help make a comfortable home. The monthly cost to the purchaser will not exceed \$39.10, of which \$7.50 will be for amortization.

For \$300.00 more the buyer may have all these and other attractions including kitchen-cabinet, shades, cabinet gas-range, electric refrigerator, plate-glass, caulked windows, copper spouting and enclosed porch. His liv-

ing room will be 18' 9" x 14' 8" and in a house financed on a plan requiring \$690 cash payment and net carrying charges of \$34.17 exclusive of \$8.00 a month for amortization.

Stepping up \$800 more in price, or slightly over \$1,000 per room, the family with \$3,000 annual income, may purchase a house 16'x54' on a lot 16'x110' and have in addition to the foregoing improvements plate mirrored doors in bed rooms, a separate stall shower, extra toilet room, linen and cedar closets, electric hair dryers, furnished breakfast nook, separate refrigerator room, electric fireplace, a double garage, terraced lawn and shrubbery and 114 feet between the rear house walls on opposite abutting lots. All for a cash payment of \$890 and a monthly carrying charge of \$39.20 and \$9.00 monthly building and loan dues.

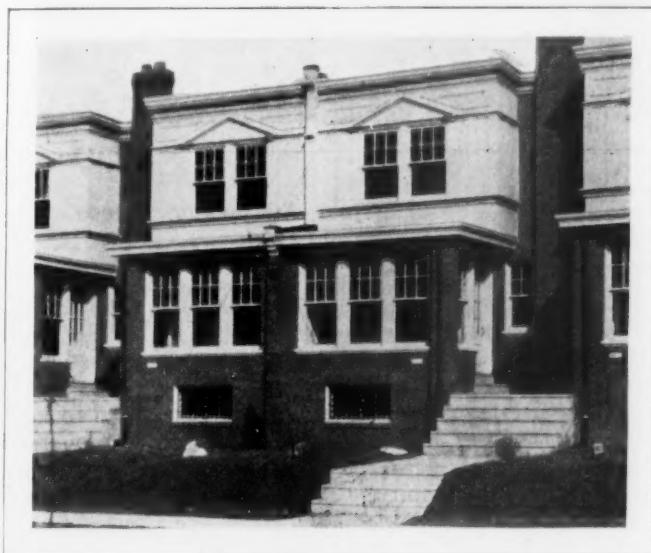
It is possible in Philadelphia today for home buyers, in the income ranges of \$25.00 to \$40.00 a week, to secure modern, attractive, well-built dwellings, equipped to relieve household drudgery, replete with the conveniences and frills that delight the average housewife, and located in areas within easy reach of car lines to the commercial and industrial centers of the city.

The city planner may take exceptions to the gridiron plan according to which these home areas are laid out. Philadelphia is weak in many phases of its planning. It is noticeable, however, that most of the new construction



These Are Called Old English Type Homes, Are Priced at \$5,750 and Have a Cash Payment of \$750. Carrying charges are \$36.66 per month. They contain hardwood floors, kitchen cabinets, gas ranges, hot water radiators and many other features. Harry Moyer is the builder.

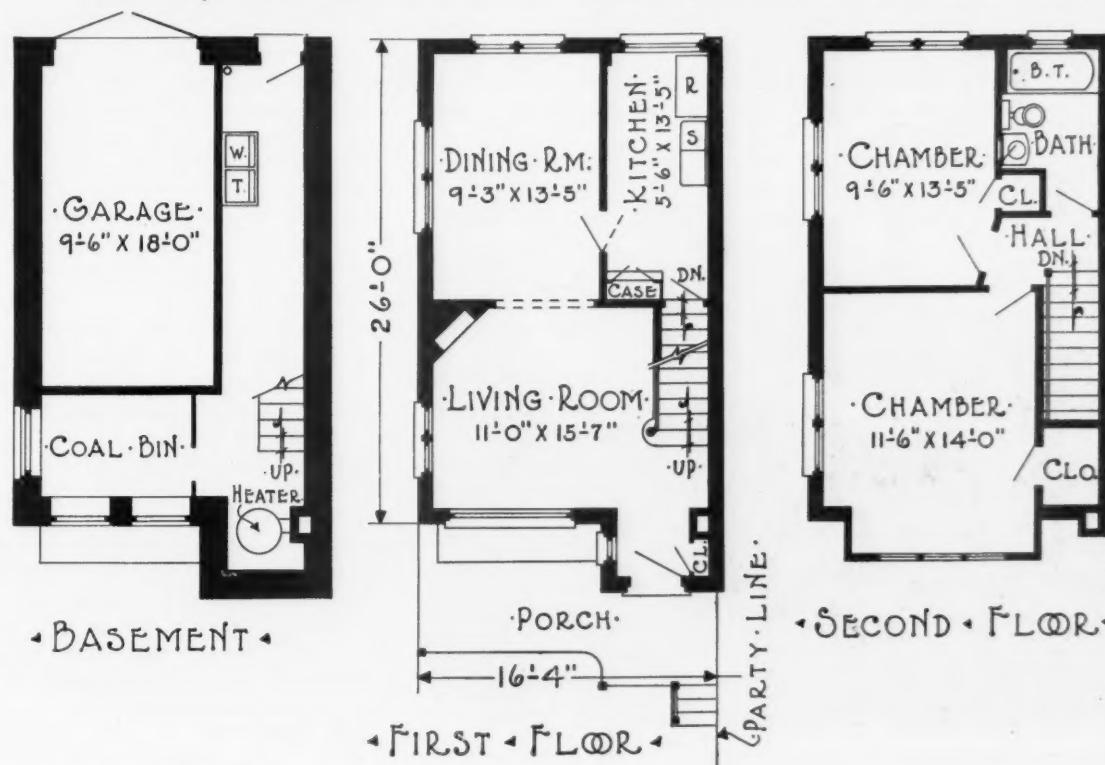
The Interior Comfort of These Homes Has Made Them Popular. Carl Meyer, the builder, prices them at \$5,890, carrying charges being \$36.91 per month. Floor plans below show layout possibilities.



A Nearer View of a Pair of the Carl Meyer Homes.

is getting away from the minimum yard area so characteristic of a decade or two ago. Thus, for example, the lowest priced new houses of today cover only 37% of the lot and average 28 houses per acre, while the \$6,200 type are built only 19 per acre—a number in excess of the ideal toward which city planners are working, but a commendable figure when erected on urban land subject to urban land prices. Philadelphia's current construction is a challenge to those cities which supinely accept building practices and financing methods, demonstrated by the experience here to be faulty, that lead them into housing types conducive to land overcrowding and congested occupancy.

Moreover, it is worthy of note in passing that sales prices of Philadelphia's new housing have been steadily declining during the past half decade. The annual informative surveys of the Philadelphia Housing Association on new dwelling construction for a period of five years show a drop in average sales price from \$8,465 in 1924 to \$6,550 in 1928 with the average construction cost reduced from \$5,400 in 1924 to \$4,300 in 1928. In the survey of 1924 it was noted that 42% of the new



Floor Plan of Typical Philadelphia Row Home to Go on a Lot 16 Feet 4 Inches Wide. End unit as shown; inside units the same except without the side windows.

construction on the market was in a price range of over \$8,000. In each subsequent year the percentage has dropped as follows: 33.7% in '25; 19.3% in '26; 15.4% in '27; and last year the percentage was 6.3. Correspondingly there was an increase in the percentage of houses erected for \$6,000 or less. Beginning in 1924 with 15.4% the total construction it ran successively 19.9%, 14.0%, 26.1% and last year 35.4%.

There is a further demonstrable fact which has been brought out by these yearly surveys and that is, that as the sales price decreases by \$1,000 units in each year's construction, the percentage of absorption increases. It is undoubtedly true that these surveys have brought home to the builders and their financial backers the business values in lowering sales prices to meet the larger market found, none the less in Philadelphia than in all cities, among the income groups in the lower ranges.

The philanthropic urge low cost housing felt by many of the more intelligent civic minded citizens which drives them to agitate for government aid in this field will not yield the results they seek nearly so quickly as will a demonstration of the business sagacity of catering to the largest market. It is only through the education of the builder and his financial backers to the greater profits in lower sales prices that the stimulus to the inventive genius is given which results in lower construction costs. Delayed absorption, with its attendant losses, may be due to one or more causes but it is a darn good teacher. And when it is primarily due to an attempt to market a product beyond the reach of the prospective buyers, it compels attention and forces a reorganization of methods previously practiced and a lowering of costs. But if the economic pressure is disturbed by subsidies, the whole economic order is changed and the resultant conditions in the housing field are more deplorable than they were before.

Of course I would not have you believe dwelling



Garages Are Reached Through Rear Alleyways. These Homes are in the \$4,500 class.

sales prices are as low as they should be or can be in Philadelphia. But they are low when compared with prices in other large cities.

There are many causes working to help them to keep low here. The sales price of a dwelling is governed by four major factors; financing charges, land costs, construction costs and the builder's profit. In the practices common to Philadelphia as they are affected by the first three factors, there may be found the substance of the fourth lesson this city has to teach in the dwelling field. Perhaps the more significant is financing procedure adopted here.

I do not refer to the method of financing builders but of financing buyers. In the financing of the builders the emphasis would be on how not to do, for financing costs

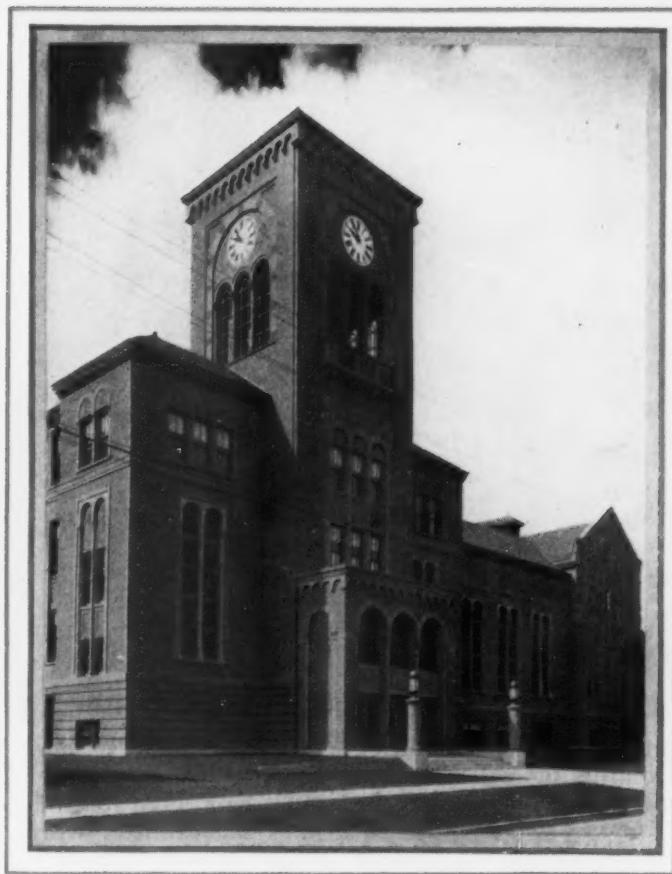
are excessively high in a large percentage of cases. It is in financing the home buyer that economics are effected which tend to lower costs.

Philadelphia is the home of the Building and Loan Associations. It has today about 3500 such associations. They are the great savings funds of the average citizen as they also are the great loan organizations for the aid of the home buyer. Unlike the practices elsewhere, many of these local associations grant loans on second mortgages. Trust company funds are used for first mortgages. The home buyer pays from ten to twenty percent cash and the balance in a Building and Loan mortgage, which is amortized in about eleven years. The monthly payment, which is slightly lower than the rent rate for a similar dwelling, takes care of the interest and credits a sum for such amortization, which sum earns interest while it is accumulating, varying from seven and one half to ten per cent. Many builders sell their houses at a lower cash payment, taking back a note

(Continued to page 128)



Matthew J. Best Has Sincerely Attempted to Make His Facades Artistic. Homes Cost \$5,390 Here.



*Entrance Lyons Township
High School, LaGrange, Ill.
Jos. C. Llewellyn Co., Architects*

Building Requirements for Modern Schools

By JOHN A. McNAMARA

WHEN it is considered that approximately twenty per cent of the entire population of the country is enrolled in schools and that in addition to this proportion there is another million people engaged in educational work in one form or another, the importance of school buildings is readily understood. At the outset it might be well to state that according to the estimate made for new buildings in 1929, schools rank third with an estimate of \$597,781,800, which amounts to 11.7 per cent of all the buildings in the country.

During the past twenty or thirty years school house building has undergone many radical changes. The "Little Red Schoolhouse" at the crossroads is fast disappearing and in its place is being built the consolidated school that takes care of pupils from many small communities. Good country roads, bus transportation and the realization by farmers that education is a necessity and not a luxury have brought about this new condition.

Another phase that is significant to the builder is the changes that have been made in the curricula in all school systems. Music has become as much a part of education as arithmetic; athletics and gym-

nasium work are as important to the growing child as geography; teaching girls how to be good housewives has taken its place along side of history, and every school has its mechanical trades department for boys as well as its commercial courses in typewriting, bookkeeping, stenography and other specialties for both boys and girls.

When it is considered that the modern high school contains a full theatre with proper electrical effects, scenery, as many seats as a medium sized motion picture theatre, with film projectors, acoustical construction and other features of the regular play house, and when it is further considered that swimming pools, laundries, bake shops, laboratories, auto repair shops, cafeterias, and fully furnished three and four room apartments are part of the school, it can be understood how far the school has advanced in the past few years.

During the past few years the cost of school construction has mounted to new heights. While in many places schools are being built as cheaply as 25 cents per cubic foot the average for the entire country has been found to be 62½ cents. Eight per cent of this amount goes into foundations and con-

[* Important information on the Design and Construction of all non-residential types of buildings, such as American Builder readers plan and build, is presented in this authoritative series.—THE EDITORS.]



Main Entrance
Stair, East High
School, Denver.
Geo. H. Williamson, Architect.

crete, more than 15 per cent will be used for brick and tile work, heating and ventilating will consume another 10 per cent and other percentages may be found in Table I.

TABLE I

	Cost per Cu. Ft.
8. % Foundation and concrete.....	\$0.04947
15.3% Brick and tile.....	.096
6.3% Stone and terra cotta.....	.0394
7. % Steel04348
3. % Roofing01846
22. % Floors and roof fireproofing.....	.1386
5.1% Plastering032
3.4% Carpentry0215
7.5% Interior finish.....	.0479
2.4% Painting01244
5. % Plumbing03163
10. % Heating and ventilating.....	.0625
5. % Electrical03162
 100.0%	 \$0.625

When these percentages are applied to the total amount estimated for 1929, we have the expenditures for one year apportioned as shown in Table II.

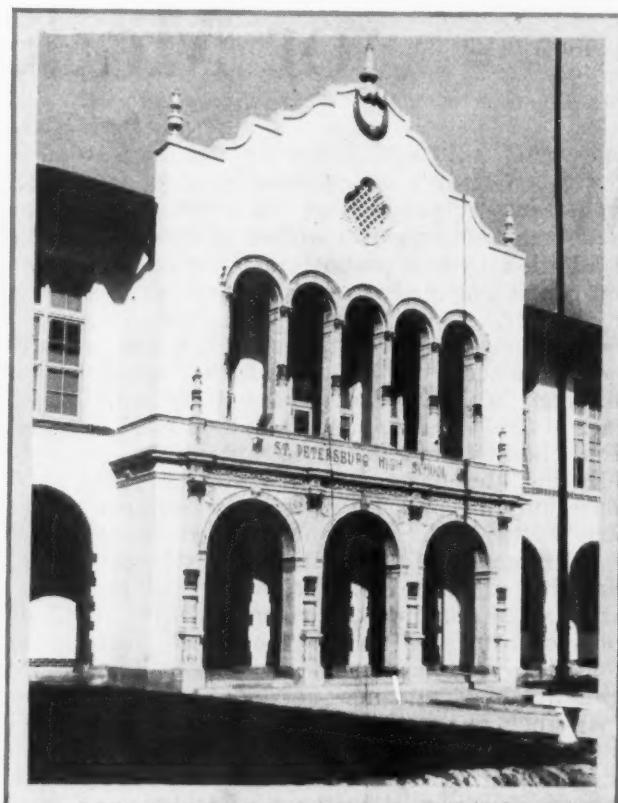
TABLE II

Foundation and concrete.....	\$ 47,822,500
Brick and tile.....	91,460,600
Stone and terra cotta.....	37,660,200
Steel	41,844,700
Roofing	17,933,400
Floors and roof fireproofing.....	131,511,900
Plastering	30,486,800
Carpentry	20,324,800
Interior finish	44,833,600
Painting	14,346,700
Plumbing	29,889,000
Heating and ventilating	59,778,100
Electrical	29,889,000

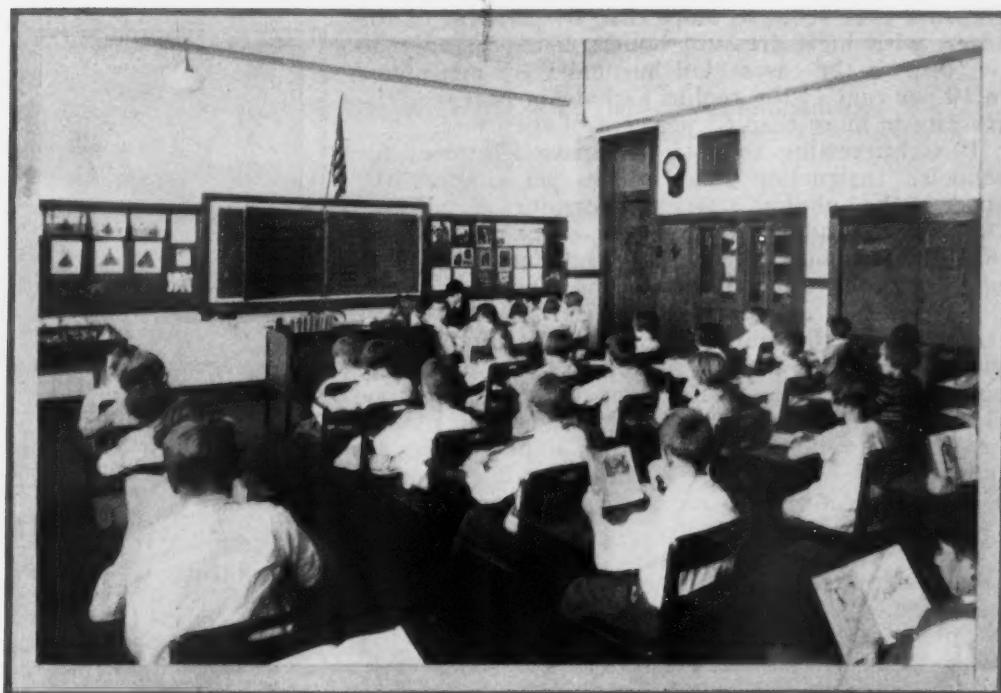
In planning the new school house the first consideration is the selection of the site, keeping in mind the probable growth in that section of the community, the terrain and how it can be best used, and the placement of the athletic field. A detailed survey should be made to ascertain what the school population will be in five and ten years. The building program is an elaborate one and one that needs most careful consideration.

Once the site has been chosen and approved, the

matter of type of construction comes up. If the school is to be a senior high school, space provisions must be figured for auditoriums, gymnasiums, chemistry laboratories, work shops of all kinds, artistically finished corridors, special treatment of the various class rooms such as the English room, the history room and the other parts of the building, the cafeteria, the locker rooms, administration offices, library and very often rooms that may be used in



St. Petersburg High School, Fla.
Wm. B. Ittner of St. Louis and M. Leo
Elliott, Associate Architects.



Healthful Conditions Are Evidently Present in This Typical 5th Grade Room.

the evening by the community for small meetings, parent-teacher association conferences and other neighborhood functions.

If the school will be used for elementary teaching, the matter of planning will be simpler. Consideration must be given to the kindergarten, special health work, cafeteria, play rooms and a few other special requirements.

If the school is a private residential school, you

will probably have all of the requirements of the public day school except the cafeteria, plus living quarters, club houses, larger kitchens for the three meal service instead of one, larger laundries, and the entire layout will be more elaborate. You may or may not have the shop schools, the commercial courses and some of the other vocational departments. In all other essentials and the type of material used the schools will be similar.

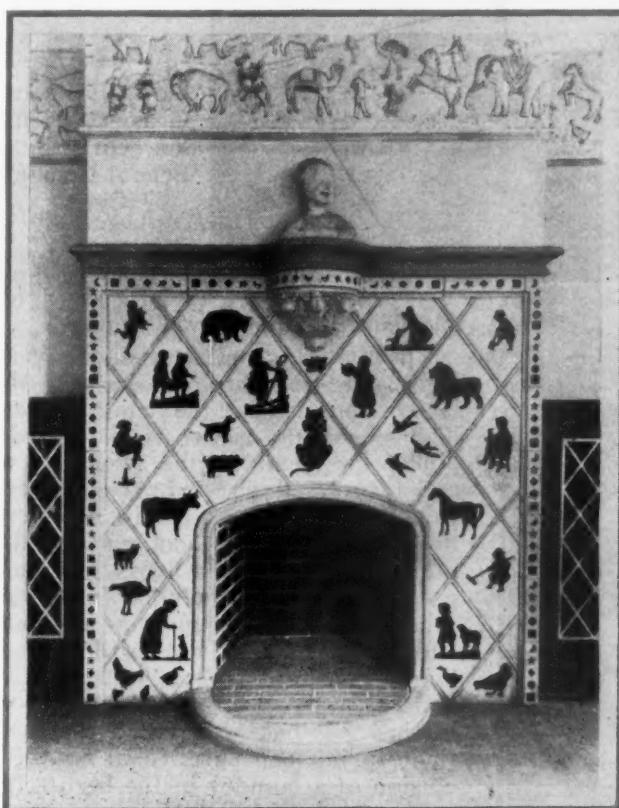
Few public schools are more than three or four stories in height and there is no tendency toward skyscrapers in this kind of construction. Corridors are wide, the stairs are spacious and comfortable, materials for sound deadening are used to a great extent, much attention is given to the floor construction, and perhaps most important of all will be the location and arrangement of rooms where the pupils will have to use their eyes continuously. Seating arrangements so that light is not blocked and a fair distribution of both light and air at all times are highly desirable.

In a construction study recently made of 440 schools built since January 1, 1928, it is shown that skeleton steel construction is used in about 31 per cent of the cases and reinforced concrete in more than 36 per cent. Brick is most popular for wall bearing being chosen in 78.64 per cent of the cases reported. Brick again was chosen for exterior use in more than 92 per cent of the work done but usually in combination with stone, terra cotta or stucco.

There seems to be a great difference of opinion when it comes to floors and each school will use several kinds of flooring. Wood, cement, terrazzo, linoleum, tile and rubber tile were most often mentioned but it is seldom that a superintendent will choose one type of flooring for the entire building. Wood may be the choice for class rooms and gymnasium, cement for work shops and laboratories, linoleum or rubber tile for corridors and other types for other departments.

Composition roofing led in this department with both tile and slate also mentioned in a large number of cases. Often there was a combination of all three.

Low pressure boilers were the most popular being



**Stimulating the Children's Interest.
Kindergarten Fireplace, Fairmont Elementary School, Denver.**

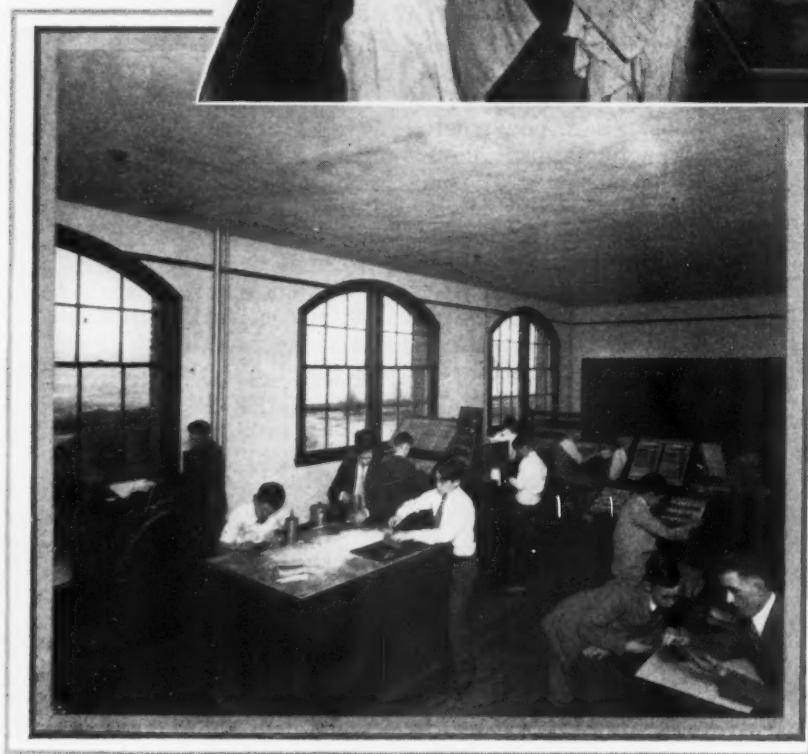
shown a preference in more than 64 per cent of the cases, with high pressure boilers listed in only 10 per cent of the cases. Oil burners were mentioned in 10 per cent of the replies and steam heat was the favorite in more than 85 per cent of the cases.

It is interesting to note the space allotment for schools. Instruction takes up 50 per cent of the space in the building, stairs and corridors are allotted 20 per cent, administration (in which is included offices, wardrobes, toilets and storage facilities) takes up 16 per cent, walls and partitions, 10 per cent, flues 3 per cent and accessories 1 per cent.

Except for the auditorium, the electrical requirements for the modern school are comparatively simple. It must be remembered that there will be electric time clocks, signal systems, motion picture projectors, radios and the usual light fixtures in most rooms of the school building. Both motion picture projectors and radios are becoming important factors in pupil instruction and it would be well for every contractor to familiarize himself with the special requirements in these two branches of education.

Special care is given to the number and placement of toilets in schools. The old idea of having all the toilets in the basement has given way to a more logical distribution of toilet to every floor. Steel partitions are generally used and the accepted policy has been to allot

B e l o w —
Printshop—
Lake Junior
High, Denver; Merril
H. and Burn-
ham Hoyt,
Architects.



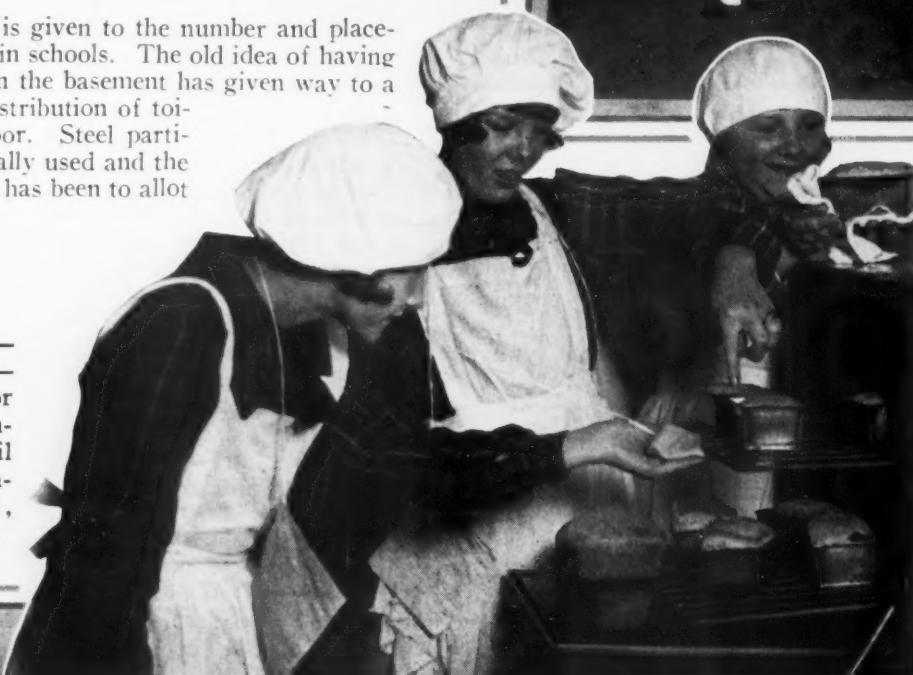
one toilet seat to every 30 pupils.

The plumbing contractor should remember that besides the toilet facilities there is to be considered in the junior and senior high schools the matter of shower baths, piping for laundries, the swimming pool and many well placed bubble fountains. Bubble fountains are to be found on every floor of the modern school building with a minimum of two to a floor. Swimming pools are always included in the new school plans and in most of the junior and senior high schools will be found laundries where athletic suits, uniforms and other clothing used by pupils are washed. It has been found that a distinct saving can be effected by the inclusion of a laundry in the high school.

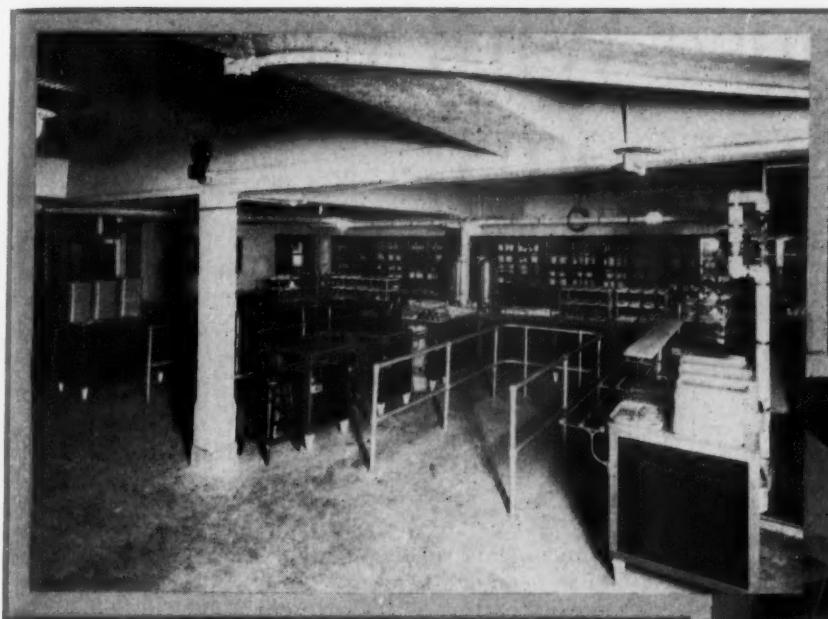
Shower baths and locker rooms adjoin the gymnasium and must be provided for in almost every instance. Often the stage of the auditorium is used as the gymnasium, and this com-



A b o v e —The
Bakery, Oppor-
tunity School,
Denver, E.
Floyd Redding,
Architect.



To Left—Sixth
Grade Milwau-
kee Girls in a
School Cooking
Class.



To Left—A Public School Cafeteria.

Below—Second Floor Corridor, Lincoln School, Evanston, Ill.; Childs and Smith, Architects.



bination has worked out unusually well, provided the lockers and showers are not too far distant but adjoining the auditorium stage. It is probable that the plumbing feature of schools has become more complicated than it was in the past when there were no swimming pools, no shower baths or laundries and when the toilets were all on one floor, usually in the basement. But the importance of good plumbing cannot be overestimated and experience has taught school superintendents that money expended for the best plumbing at the beginning is an economy not equalled by the selection of any other detail.

School lighting has been given special study within the past five years. The arrangement of pupils' seats, the expanse of glass and the shades used in schools have all been considered so that there is less eye strain now than formerly among pupils. Study rooms with light on two or three sides is the ideal and when this is possible the health of the children is noticeably improved.

Flooring material is another important item. Floors that will not fatigue either the pupils or the teachers are important. Durability, comfort and reaction to various cleansing methods all are taken into consideration when floors are chosen.

It has become the vogue within the past few years to give special treatment to special rooms, hence

the English room will often take on the appearance of a room in the time of Shakespeare, the foreign language class room may be a replica of the old Roman Forum, and the corridors will be so designed as to inspire the young. Walls hung with etchings, historical pictures, statues of famous Americans and other decorations are becoming rather common in the more costly schools.

There is practically no difference in the school cafeteria and the commercial cafeteria with the exception that it will be found that the school cafeteria pays more attention to diets and cleanliness than the average restaurant. While it is used only once a day in most schools, it has become a great factor in feeding. There are nearly 65,000 school cafeterias in the United States at the present time and every school that is being built includes this department as a matter of course.

The changing use of the school house, the fact that schools are becoming year round institutions instead of for nine and a half months, that the community is using them and that a greater variety of practical subjects is being taught, are all factors that must be given study and consideration by the school house architect and building contractor.

Public Garages

NEXT MONTH



Continuing this series on important SPECIAL buildings, TOM WILDER will present "Present Requirements in Public Garages" in December "American Builder."

"The House With Eight Bathrooms"

EUGENE H. KLABER and ERNEST A. GRUNSFELD, Jr., *Architects*

THE residence of Martin L. Straus has been described as "the house with eight bathrooms," but such a description leaves entirely too much to the imagination. This beautiful home, in the exclusive North Shore district of Chicago, was designed by Eugene H. Klaber and Ernest A. Grunsfeld, Jr., Architects, of Chicago. It is the embodiment of all that is to be desired in a home and, as such, is well worthy of study by anyone concerned with the design and building of homes.

The eight bathrooms are an example of the extent to which the present day demand for more and better home equipment can be carried. It marks a distinct tendency to provide more than one bathroom, or at least an extra lavatory, in even the smaller homes, as well as many other conveniences which are now in popular demand.

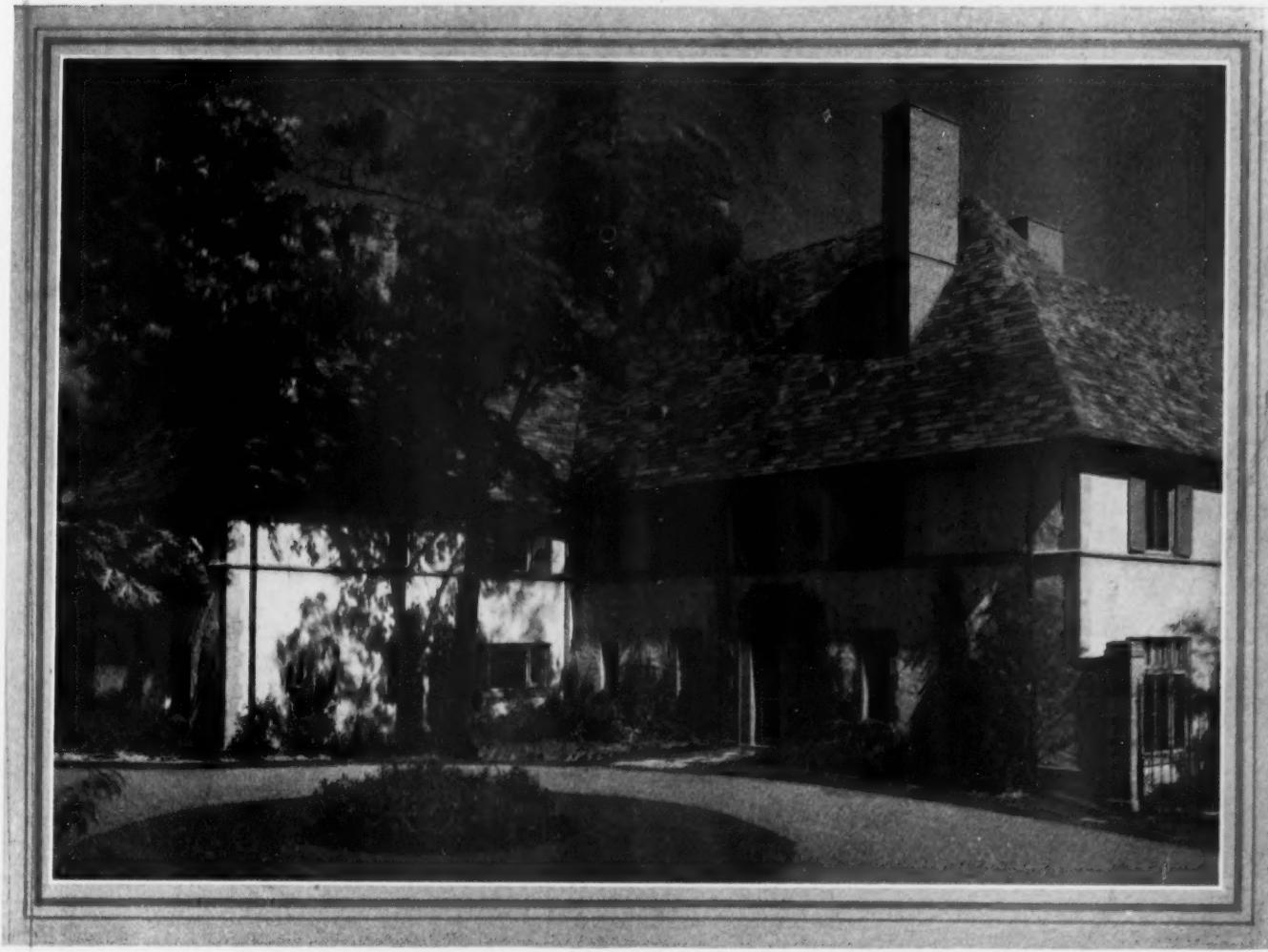
One conspicuous feature of this plan is the way

in which the architects have handled the problem of providing every room in this large house with a maximum share of daylight. Practically every room has windows on two or more sides. Dark rooms make a house undesirable, plenty of light makes it easy to sell and increases its value.

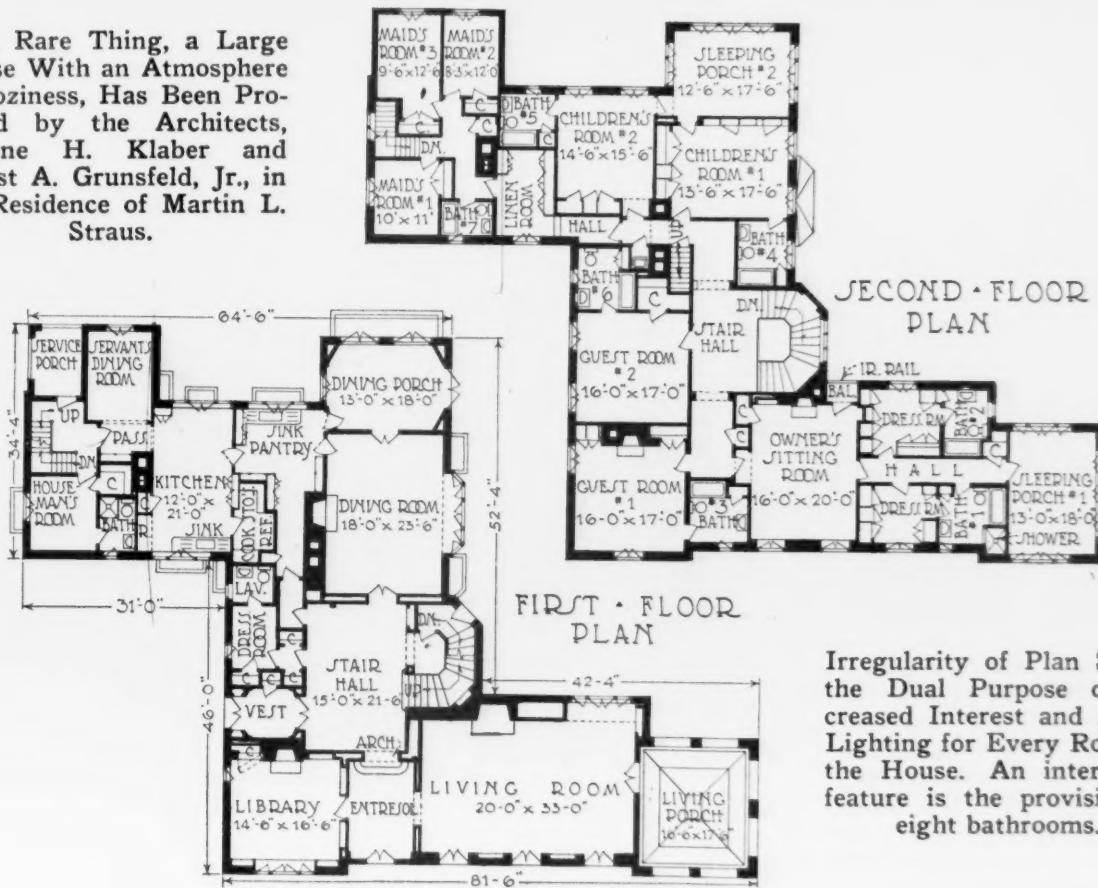
In spite of its size, this house possesses a snug, almost cozy, appearance which makes a strong appeal. Many large houses, while impressive in appearance, do not seem homelike. Success along this line has been achieved in the Straus residence largely by means of the roof treatment. The hip roof with its long sweeping lines is set low over the second story and wide sheltering eaves project beyond the walls. The effect is further enhanced by the lack of high foundation and an entrance at the grade level.



The Library, Wood Paneled in Simple Colonial Style, Is Characteristic of the Whole Interior Treatment of This Beautiful and Unusual Residence Which Decorates Chicago's North Shore.



That Rare Thing, a Large House With an Atmosphere of Coziness, Has Been Produced by the Architects, Eugene H. Klaber and Ernest A. Grunsfeld, Jr., in the Residence of Martin L. Straus.



Irregularity of Plan Serves the Dual Purpose of Increased Interest and Better Lighting for Every Room in the House. An interesting feature is the provision of eight bathrooms.



J. A. Hiller

THE Hiller Brothers successfully combine vision with practical business and sales ability. At a time when good design and sound construction were scarce they began to provide fine houses and are still doing it in a big way.



Gus. Hiller

TEN years ago, J. A. and Gus Hiller, two brothers, entered the home building field in Portland, Oregon. Faith in the idea that home buyers really wanted quality homes prompted them to buy two lots and directly supervise the building of two moderate priced homes.

These they immediately placed on the market under the trade brand of *Hiller-Built Homes*, adopting an attractive brass marker as a permanent name plate. These homes sold readily because they displayed a fine detail of planning and construction that readily appealed to people with better judgment.

At the start of their business the two brothers acted both as salesmen and advisory experts. Today they employ ten salesmen, three architects, and a competent office force in addition to their construction crews. *Hiller-Built homes* have attained a

The American Builder cordially welcomes among its readers those Realtors who are engaged in home building or who are affiliated with builders in the development of home properties.

NEXT MONTH a notable eastern development will be described.

THE EDITORS.

Quality Guaranteed

Makes **HILLER-BUILT** Homes Easy to Sell

Methods of These Successful Western Builders Described

By N. S. SOMMERS

monthly labor and material expense volume of around \$30,000.

An average of twenty-five fine homes are always under construction by Hiller Bros. in their various subdivision developments. And occasionally they develop subdivisions for investment companies under contract.

"Our main business is in tract development," says Mr. J. A. Hiller, "and the underlying principle of our design policy is for true-to-type style of architecture in each district. Thus, if any individual wishes a house specially constructed in a district under process of construction, unless he is willing to accept plans in harmony with the prevailing type, we do not accept the commission. We do, however, endeavor to interest him in one of our other subdivisions, where the style of architecture is such as he has in mind."

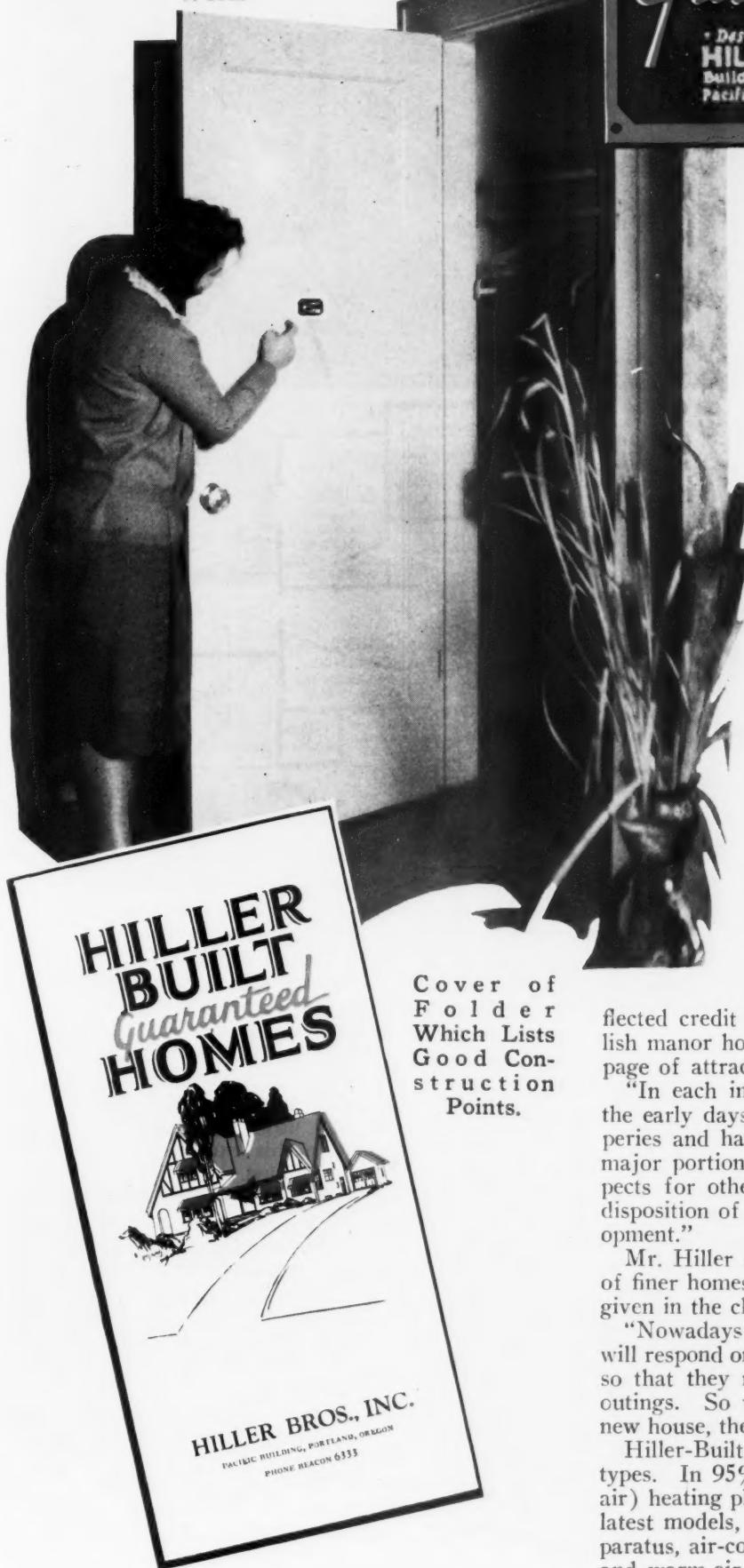
Every time Hiller Bros. open up a new subdivision, one house of outstanding design is completely furnished, through cooperation with some prominent local home furnishers, and thrown open to the general public for inspection.

"We find nothing less than full page newspaper ads



The Architecture of Each Hiller-Built Home Is Determined by That Prevailing in Its Particular Locality.

A Brass Plate Enamedled in Red and Black, Numbered and Dated Is Attached to the Inside of Each Front Hall Wardrobe Door to Identify the Builder, Guaranteeing His Work.



Cover of
Folder
Which Lists
Good Con-
struction
Points.

HILLER BROS., INC.
PACIFIC BUILDING, PORTLAND, OREGON
PHONE BEACON 6333

strong enough to put a new development over in the way we desire," declares Mr. Hiller, and from the brilliant success they have had with every one of their model home demonstrations, it is very evident that this means of spreading publicity is a practical one.

"Our first model home," says Mr. Hiller, "was built to sell for \$13,000. More than 17,500 visitors called 4,300 of whom inspected the home on the first day of the reception. The house was sold during the exhibition, and many more houses as well, most of which were higher priced than the one advertised.

"Next came the 'Budget Home', in which a leading department store worked on a budget plan of home furnishing, having an attendant inside to hand out illustrated booklets detailing the cost of furnishing every item in the room.

"So well did this idea go over that we repeated the cooperation idea again, next time in a higher priced Budget Home, which once more brought undreamed of throngs of visitors. And later, when a still more pretentious development was opened up, this time furnished by the leading newspaper, which cooperated with the same home furnishers that made the other two model homes attractive, the attendance was overwhelming. For, by giving the newspaper the opportunity to reap their share of the glory, in re-

flected credit for the furnishing of the dignified English manor house, we received the benefit of page upon page of attractively illustrated articles.

"In each instance, the model home was sold during the early days of its opening, usually with all the draperies and hangings complete, and frequently with the major portions of its furnishing. And scores of prospects for other sales were obtained, resulting in early disposition of practically every house in the large development."

Mr. Hiller states that no longer does the advertising of finer homes pull when office phone numbers only are given in the classified advertisements.

"Nowadays people interested in the better type homes will respond only when the address of the house is given, so that they may drive out and see it while on their outings. So we always leave someone in charge of a new house, then advertise that it is open for inspection."

Hiller-Built homes are mainly English and Colonial types. In 95% of the homes that they build, gas (hot air) heating plants are provided, which, in some of their latest models, are equipped with water air-washing apparatus, air-cooling systems for warm weather comfort, and warm-air clothes dryers for winter convenience.

Besides the widespread newspaper publicity gained through their model home exhibits, Hiller Bros. devote infinite pains to the compilation of educational matter into attractive booklets.

"We believe that the prospective homeowner must be well educated to the importance of 'good' construction," Mr. Hiller says, "and towards this end we have explained many features of home building not usually understood by the laymen."

No less than 47 salient points are brought out in the Hiller literature, concerning the structural features of the Hiller-Built homes.

"Whether readers of our literature are prospects for homes or not," Mr. Hiller points out, "at least they learn the difference between a well built and a cheaply built home when we have finished 'educating' them."

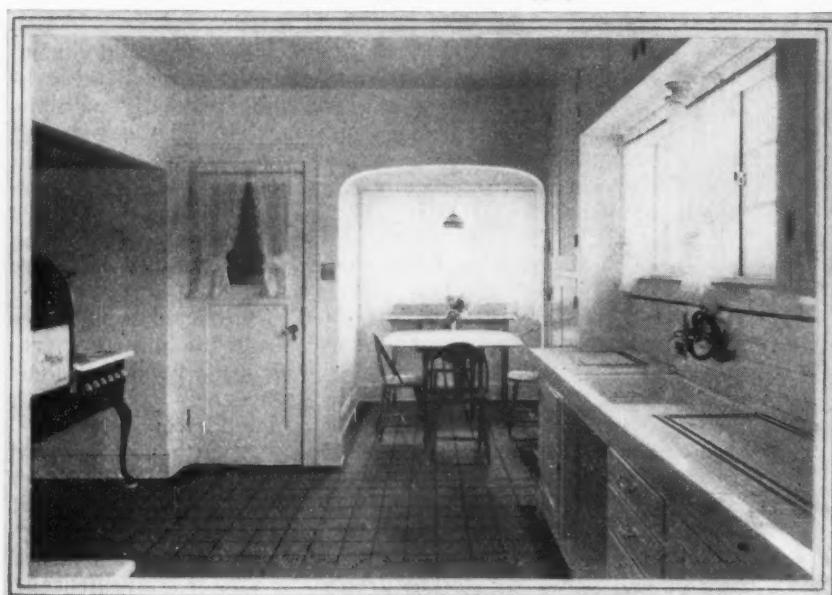
When completed, a Hiller-Built home is left in a condition to be moved into, whether or not it has been sold. The floors are waxed and polished. The windows are washed. Every thing is tried and tested, the kitchen linoleum washed, the porches and basement left immaculate, and if the house has been sold, water, gas and electricity are turned on and ready to use.



Above:
Such Living
Rooms Ap-
peal.



Below:
Efficiency
Kitchen and
Breakfast
Room.



Hiller-Built homes range in selling price, in addition to the cost of the lots, from \$5,000 to \$20,000. Not only have they established a reputation for good construction but their beautiful, convenient interiors have become almost a standard in Portland.

In the kitchens and bathrooms they have made a definitely standardized plan, which, through careful analysis, they have brought up to high efficiency.

Long, narrow kitchens provide immediate access from sink to stove without one wasted step, and no matter how low priced the Hiller-Built home is, this excellent feature is always provided.

Super-construction of built-ins, immaculate perfection in finishing, and gay, colorful decorations seldom fail to win prospects.

A Hiller-Built bathroom always has a built-in dressing table, where the door to the centrally located cabinet is raised high enough so that it will not sweep away toilet articles spread out below. The bathrooms usually have the tubs either set back into a hooded over recess, or dropped about eight inches, so that the owner steps down into the tub, instead of climbing up first. The newest bathroom feature in their higher priced homes is a plate glass door to the shower bath.

A Hiller-Built Home lasts longer because...

In every Hiller-Built home only the best materials are used. Better materials plus better construction methods stabilize your investment in your Hiller-Built home by insuring a high resale value if you ever desire to sell. The illustrations below show the different methods employed in framing the sub-structure. They illustrate only a few of the dozens of salient features embodied in the Hiller Standard of construction.

The Hiller Way

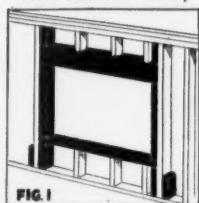


FIG. 1

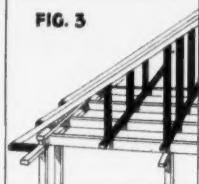


FIG. 3

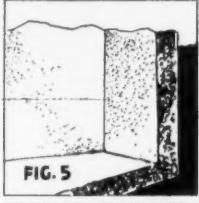


FIG. 5

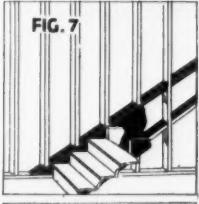


FIG. 7

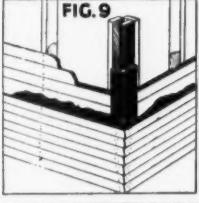


FIG. 9

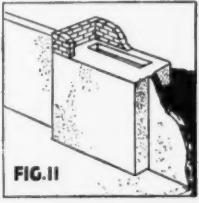


FIG. 11

WINDOW FRAMING

In Fig. 1, note the two heavy 2x6-inch edgewise timbers across the top of the opening. This forms a 4x6-inch header which is sufficient to carry five times the normal load. Compare these with the two fragile flatwise 2x4-inch headers shown in Fig. 2.

Note the additional perpendicular supports on the inside of the opening supporting the ends of the headers carrying the load down to the lower plate. Note also the bracings under the plate which carry this load to the floor. The Hiller method eliminates binding of doors and windows, plaster cracking around windows, etc.

ROOF SUPPORTS

Note the additional row of supports which give greater strength and rigidity to the rafters. The row of longer studs shown in Fig. 3 is placed one under each rafter 16 inches apart—the shorter row is placed 24 inches apart. By the cheaper method (Fig. 4) only one row is used, these 24 inches apart. The Hiller method minimizes vibration and prevents sagging and settling.

FOUNDATION

The illustration shows the difference between care and carelessness. The amount of concrete saved by the rounding corner shown in Fig. 6, would be negligible. This saving is usually not the cause, but is most often due to carelessness. The loose dirt falling off of the wall when the forms are being set in the excavation fills up the outside corner at the bottom of the form. By the Hiller method a special tool is employed to remove this loose dirt which is the cause of the weak corners shown in illustration, Fig. 6.

STAIRWAYS

Note in Fig. 7 the two rows of extra bracing blocks between the studs which add strength and rigidity to the stair. By the careless method shown in Fig. 8, the stair-jacks are nailed directly to the studs without any bracing, resulting in separation of the steps at the joints and squeaking at every step. By the Hiller method the load is distributed in such a manner that squeaking and separation is entirely eliminated.

CORNER CONSTRUCTION

Note the three 2x4-inch studs with the bracing blocks inserted between, forming a heavy corner post, in Fig. 9. Compare this construction with Fig. 10, where only the two 2x4-inch studs are used, leaving a cavity in the corner which does not allow for nailing close to the end of the siding strips. In the latter case separation at the corners is certain to occur. By the Hiller method, separation is impossible, as the heavy interlocked timbers could not give under any circumstances.

CHIMNEY FOUNDATIONS

In Fig. 11, the foundation for the chimney and fireplace is made a part of the basement wall by special built forms allowing these foundations to be poured the same time the wall is poured, forming a single unit foundation. In Fig. 12, the fragile brick sub-walls are run up after the structure has been built. Construction of this kind usually results in the appearance of unsightly yawning cracks around the mantel in the interior, and separation of the siding and chimney on the exterior.

The Cheaper Way

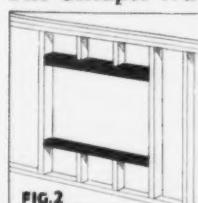


FIG. 2

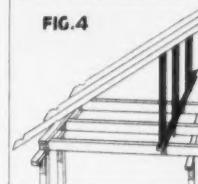


FIG. 4

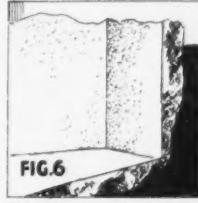


FIG. 6

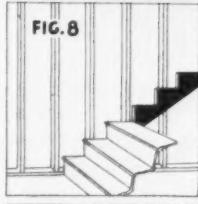


FIG. 8

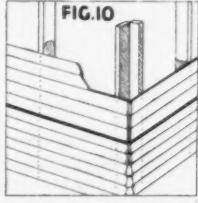


FIG. 10

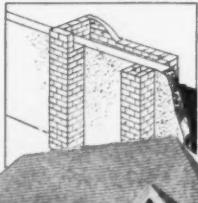


FIG. 11



FIG. 12

*How
do your
building
methods
compare
with
Hiller's?*

*Study
these
charts!*



Above:

Inside of Folder, Size 11 by 16 Inches, Which Educates the Public on Hiller Quality.

To Right:

A Typical Hiller-Built Home.
For floor plans and interior views,
see page opposite



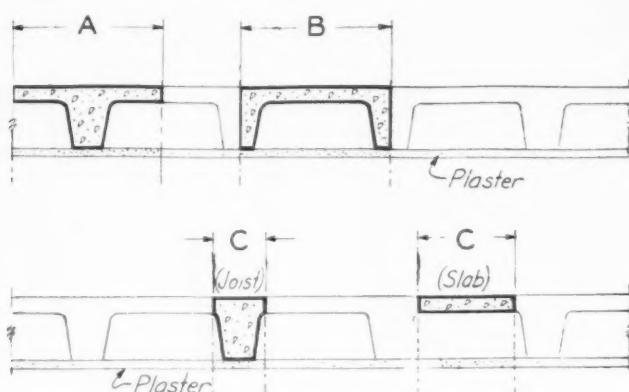
Precast Floor Systems

Recent Developments in this Growing Field

By W. D. M. ALLAN

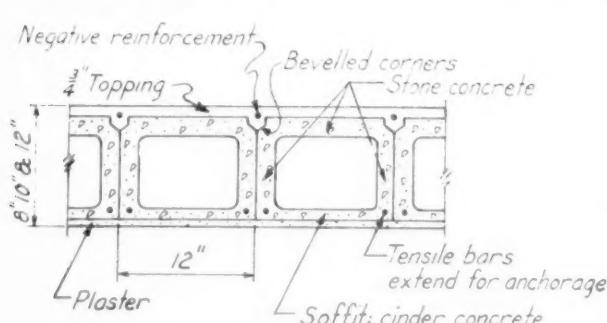
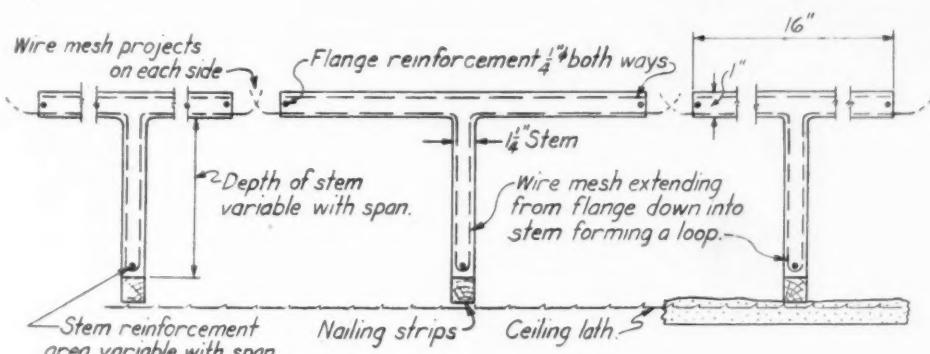
Mgr. Cement Products Bureau, Portland Cement Assn.

THE American home of today is more and more demanding built-in firesafety, rigidity and freedom from repairs and depreciation. Evidence of this is seen in the increasing demand for masonry, for permanent, attractive wall construction. In floor construction, likewise, the farsighted home owner insists on durability and firesafety.



Above: Fig. 1. Cross Section of Ribbed Floor Showing How Shapes of Precast Units are Derived.

To Right: Fig. 2. Tee Stone Units, Precast T-beam Sections with Flange Forming Floor Slab and Stem Acting as Supporting Joist. Extending wires overlap; when joints are pointed units form a continuous slab.



Above: Fig. 3. Miller Units—Cross Section Showing How Rectangular Tubes Are Assembled.

To Right: Fig. 4. Channel Shaped Floor Units Are Used in Short Spans; Deeper Ribs Required for Longer Spans. Concrete topping as shown in Fig. 3 may be used in place of sleepers and flooring.

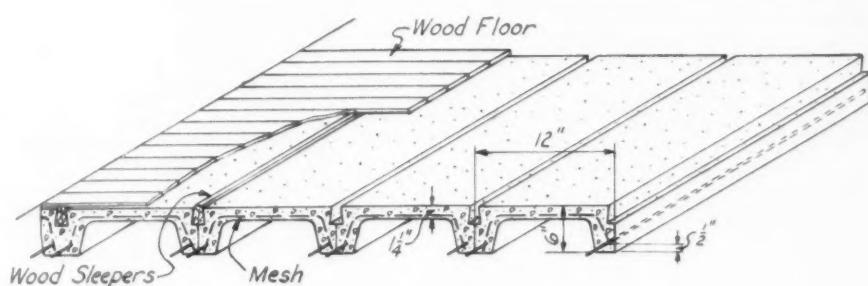
It is now recognized that concrete floors, which are standard construction in hotels, hospitals, schools and other buildings are equally suitable to residences and meet all the demands of the farsighted home owner. Particularly noteworthy in this connection is the advance made in the development of precast concrete floors which can be handled and put in place with a minimum of equipment.

Progress in designing these units has been stimulated by recent developments in the field of light weight aggregates which have made it possible to reduce the weight of a given section by 30 per cent or more. Concrete made of haydite, a porous aggregate of burned clay or shale, weighs about 100 lbs. per cu. ft. and has approximately the same strength as stone concrete. Aerocrete and bubblestone, light porous cement products that are filled with minute gas or air bubbles, weigh 50 to 70 lbs. per cu. ft. for the grade used in floors. Possessing the additional advantages of sound and heat insulating properties these and other light weight

aggregates such as cinders open up new opportunities for precast concrete units.

Most of the precast systems described herein are based on the ribbed type of floor construction. This is graphically illustrated in Fig. 1. Neglecting the ceiling slab, section A gives a T-section; B, a channel or inverted trough, and C, a separate joist and slab. If the ceiling is included, A gives an H-section, B a hollow rectangular section, and C a joist with both floor and ceiling slabs.

If, instead of the foregoing, a two-way joist floor is taken as the basis of construction and divided into



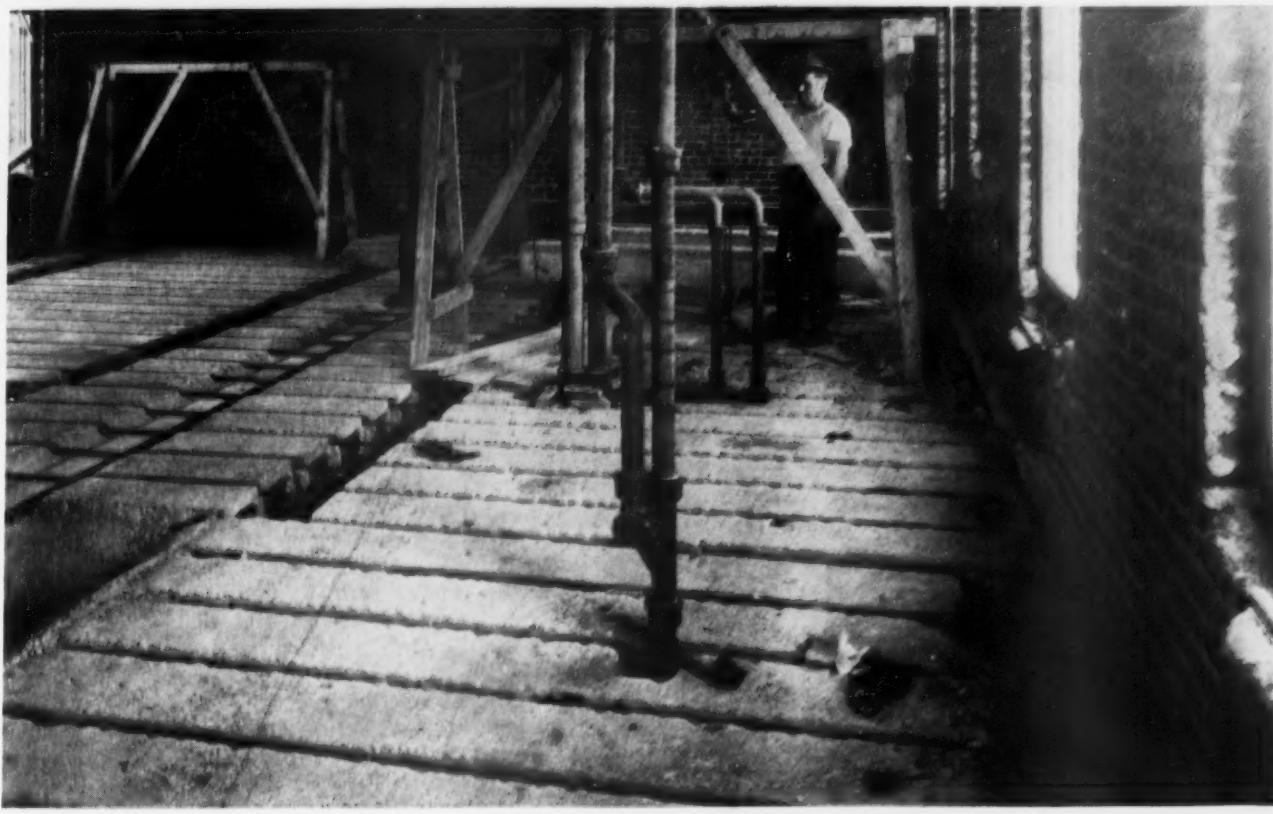


Fig. 5. Miller Units Assembled Before Concrete Topping Is Placed. When open space between ends of units is filled with concrete, projecting bars are embedded and anchored.

sections, the result is a small, square, box-shaped unit or tile.

Tee Section

Tee stone floor and roof units shown in Fig. 2 are precast T-beam sections with the flange forming the floor slab and the stem acting as supporting joist. Over 65,000 square feet of these units, developed by a New York builder have been used in the roof deck on the Starlight Park Coliseum, New York.

Tee stone beams although weighing only 12 to 20 lbs. per sq. ft. have been shown by tests to be capable of carrying heavy loads on spans up to 20 feet. The beams are made of thin sections of dense concrete reinforced with steel. Density and absence of voids are secured by vibrating the forms while they are being filled with a 1:2:2 concrete. Dimensions of the section and area of the tensile steel in the stem are adjusted to suit span and load. The flange is reinforced with $\frac{1}{4}$ -inch round rods running lengthwise and crosswise and with wire mesh extending across the flange and looped down into the stem as shown.

The floor is built by laying the individual units side by side an inch or so apart, so that the projecting wires from each unit will overlap. When the joists are pointed up with mortar, these overlapping wires are embedded and the sections are tied together. Ceiling lath is attached to a wooden nailing strip anchored to stems at time of manufacture.

Hollow Rectangular Section

The Miller system, as installed by another New York contractor has been successfully used in the construction of long span floors in New York and in England, has passed tests by Columbia Univer-

sity, and has been approved by the New York City Building Department for general use on all spans and loadings. For residences, 8-inch floors may be used in spans up to 18 feet.

Miller units, as shown in Figs. 3 and 5, are shaped like rectangular tubes, the top and sides of which are made of stone concrete to take compression and shear, while the soffit, which gives a flat ceiling surface, is of rough cinder concrete to give a good key for the plaster. Steel bars run the length of the base and extend about 8 inches at each end for anchorage.

Floors are made for any span by combining a center unit of standard length with one or two end units of variable length leaving a space of 8 or 10 inches between rows to take up small adjustments of span. This space when filled with concrete—the only concreting required on the job—acts as a locking joint to embed and anchor the projecting reinforcing bars and to tie the whole structure together. This space can also be used by the plumbers and other trades for laying pipes and conduits, although holes can be readily cut anywhere in the units. The floor is finished with a $\frac{3}{4}$ -inch mortar topping above and a plaster coating below.

To test the rigidity of the floor, two full bays in an apartment building designed for 40 pounds per square foot were loaded to four times the design load with a resulting deflection of only $1/16$ -inch on a 15-foot span.

Channel Sections

Channel sections have been used extensively for precast units, millions of square feet of concrete roof slabs with this section having been installed in industrial and commercial buildings in recent years. Channel shaped floor units have been used in the



Fig. 6. Bedding Joists in Mortar. These joists may be cut to length and handled almost as easily as lumber.

77 houses built by the Moore system for the Humble Oil Company, Texas, and for the floors in hundreds of precast houses built during and after the war by the Unit Construction Company of St. Louis. A Pittsburgh concern is developing a unit of the design indicated in Fig. 4, 30,000 square feet of which will be installed in a six-story building in Pittsburgh. As an indication of the strength of channel sections, tests have shown that a 10-foot roof slab of 3,000 pound haydite-concrete only $1\frac{3}{8}$ -inch thick and 4 inches deep at the ribs will carry a uniformly distributed load of 170 pounds per square foot with a deflection of only $\frac{1}{2}$ inch. Increased spans can be obtained by using deeper and heavier ribs.

Joist and Slab Sections

In order to lighten the precast sections, systems have been developed which use joists with separate flanges or slabs. (Refer to "C" sections in Fig. 1.) These joists may be designed to carry the full load in themselves, or they may be designed as the stem of a tee-beam using the floor slab, to be placed later as the flange. In the latter case the slab should be securely bonded to the stem, preferably by projecting reinforcement.

A recently developed example of joist and slab sections is the construction designed by Howard F. Young, an architect of Kalamazoo, Michigan. This

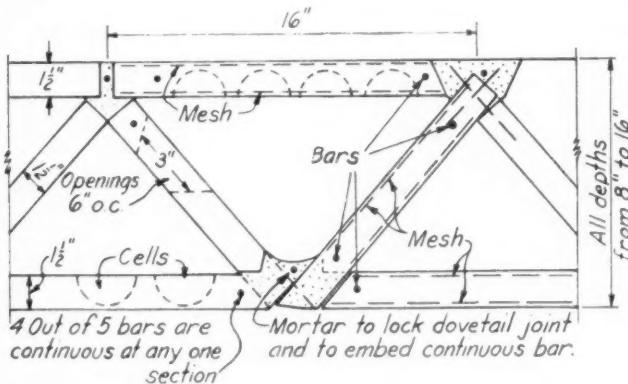


Fig. 7. Z Floor System. The inclined web members, when combined with the interlocking floor and ceiling slabs, form a transverse truss for distribution of loads.

system involves the use of factory-made reinforced concrete joists rolled under heavy pressure through a series of graduated rollers. The use of lightweight aggregates reduces the weights of the joists about 40 per cent without sacrificing strength. These joists, which weigh less than 10 lbs. per foot may be handled almost as easily as lumber and may be readily cut to length with portable electric hand saws such as are used in cutting stone slabs on construction work. The standard sizes are 6, 8, 10 and 12 inch depths with $2\frac{3}{4}$ -inch thickness and lengths up to 20 feet as now used. These joists are commonly spaced 24 inches apart. They have a thin web similar to an I-beam section in which are uniformly spaced openings for the passage of wires, pipes, etc., and for the ready connection of suspended ceilings, pipe hangers, etc., and for the support of metal pans.

These joists are bedded in mortar on masonry supporting walls. (Fig. 6.) Beams for supporting spans between columns, etc., are assembled from multiples of the standard joists. Inverted metal pans are supported on thin wooden pieces thrust between the holes in the joists. A light weight, steel mesh reinforcing is stretched across the pans and then the concrete for the slab is deposited $1\frac{1}{2}$ -inch to 2-inches thick over the entire floor area, locking itself around the top flanges of the joists. These pan forms are removable and may be re-used indefinitely.

Another floor system employing joists but on a different principle is the Z floor, a system of long span construction, developed by a Chicago construction company. (See Fig. 7.) This novel design results from combining the functions of joists, bridging and ceiling. The inclined web members, when combined with the interlocking floor and ceiling slabs form a sort of transverse truss so that concentrated loads are distributed to a number of joists. Pipe and conduit can be installed before top slabs are placed. Long floor spans up to 24 feet can be constructed with units easily handled by two men by using one main unit of stock length and one end unit of variable length. Thus the bulk of the pieces are stock length units. Joints are staggered at the lower intersection so that four out of five reinforcing bars are continuous at any one point, the fifth bar being embedded its full length in the mortar joint used to lock the dovetail units together. Negative steel is placed in the upper joints where the slabs continue over supports.

Low cost of manufacture is claimed for this system. Another advantage claimed is that even when the units are slightly warped they may be easily sprung into place due to their flexibility.

"WASTE, NOT HIGH WAGES, MAKES BUILDING COSTLY"

by one of America's Foremost Builders

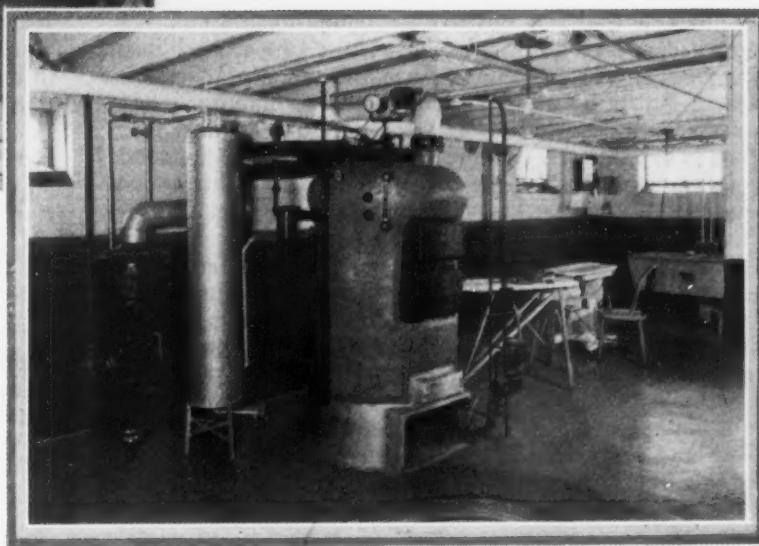
WILL BE PRESENTED IN THE DECEMBER ISSUE



Putting the Basement to Work

A Story from the Field

By E. A. MAGURN



Two Views of a Detroit Basement

How Speculative Builders Are Getting Sales Value Out of Modern Basements

EVOLUTION of the modern home continues to adapt itself to the progress of human invention and manufacture. New comforts and conveniences are constantly being added in the march towards the Utopia of the future. Builders and designers must give thought to modern trends and perfection of equipment, especially as mechanical development opens up new possibilities in design.

Today, the old-fashioned basement is obsolete and the modern basement embodies such a radical advance as to affect the entire house design. The slogan, expressed by some builders—"Seven Rooms in a Six-Room House"—scarcely does justice to the possibilities of the modern basement. For here, instead of the former dark, dirty and moldy basement space, clean, dry, cheerfully daylighted rooms with the best of finish are being developed for recreational or other living use.

Now, it is perfectly possible, if desired, to so develop the plan of the house as to effect economies in upstairs floor space in proportion to the living space reclaimed in the basement. Or the living space in the basement may be made to represent an entirely additional gain in recreational or living space.

The structural cost of a basement varies from 15% to 25% of the entire structural cost of the building. Excavation and concreting are heavy cost items, to which, of course, must be added the cost of frames and sash, stairways, supporting posts and beams and other structural items without considering the necessary heating plant, coal bins, etc. A large percentage of the cubage of the house was represented by the old-style basement and a large portion of this space was unused. Builders, today, are installing recreation rooms for family life or informal entertainment developed in a great variety

of ways for lounging, music rooms, dancing, children's play rooms, "dens" with desk space, amateur movie theaters, gymnasiums, libraries, billiard rooms, study rooms, card alcoves, refreshment rooms and a number of other uses. These rooms are being daylighted with almost full-length casement or double-hung windows opening on areaways. Entrances and stairways are made attractive and fit for the use of guests. Walls and ceilings are plastered and decorated and the laundry, boiler room, lavatory and refreshment rooms are partitioned off from the living, recreational or children's play room.

In designing the basement, the builder will be guided by a number of factors: the size of the house and resale price, the character of the neighborhood, the income and style of living of its inhabitants and the class of buyers he wishes to attract.

If the resale price is to be in the medium or lower price range, it is possible for the builder to install a basement dining room, kitchen, laundry and boiler room and a recreation room or children's play room in a bungalow basement. It will also be possible to limit the size of such a bungalow to exterior dimensions of 32 feet by 24 feet and still have a large living room, three medium size bed rooms, bath, plenty of closets, and, in the basement, a commodious recreation room, dining room, kitchen, pantry, boiler room, fuel room and laundry—or a garage can be substituted for the recreation room, although not, of course, in the same basement location.

Here is real design economy. In other words, we have gained two living rooms, each 16 feet by 12 feet, a good sized kitchen and pantry in the basement, in addition to the regular old time features of boiler and

fuel room and laundry. This is a clear gain of 576 square feet on a total of 1,536 square feet, or a saving of 37%. Transposed into money, this would cut the cost of a \$15,000 home to \$9,450, plus a basement finish expense of, possibly \$1,200, or we can spend the price of a modern, fully automatic heating plant costing \$600.00, an automatic refrigerator, an electric dishwasher sink, a built-in incinerator, a water softener, and a number of other modern features and still save \$2,800 under the cost of a bungalow of equal livable floor space with an old-fashioned basement.

In a two-story house with basement, the comparison would not work out in the same way because the proportion of basement space to upstairs living space is not as large. However, this is bound to be true: that any basement space utilized as recreational or living room space is a clear gain, be it in a two-story house or a bungalow. Whether to use the modern basement idea in cutting costs or adding facilities, or both, is, of course, entirely within the discretion of the designer. If he is progressive—in line with the times—and a good merchandiser, he is sure to perceive that attractive equipment, along with good design and construction, is what is selling homes today.

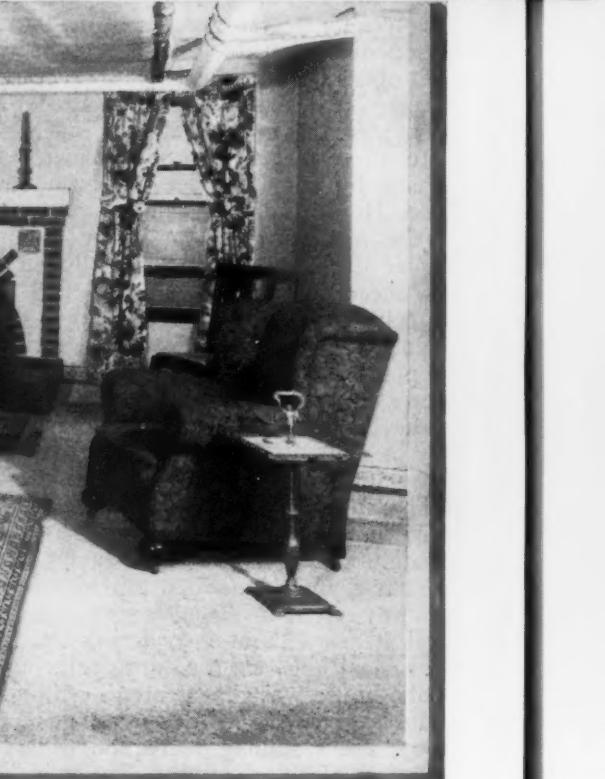
There is great attractiveness in a *completely equipped* home. That was settled in my mind after inspecting the work of resale builders in a number of our leading cities. I have driven past miles of beautiful new homes in recently added residential sections. I have talked with builders and been shown through completed homes and homes in various stages of completion. In Buffalo, Cleveland and Detroit, enterprising builders are flood-lighting these homes and keeping them open at night;

and some of them are displaying signs with a list of the attractive equipment features installed. These homes ranged in price all the way from \$9,200 to \$85,000—perhaps the largest volume being priced at \$18,000, \$20,000, \$40,000 and \$60,000.

What makes these new homes sell so readily? I asked myself this question time and again, and, of course, the answer is *attractiveness*; they create desire. They are in the modern style. They make the old homes look old-fashioned. There is, in and around the new homes,

To Right:
Basement
Recreation Room
in a Philadelphian
Home
Built by
McWilliams and
Meloney.

Below: A
Detroit
Basement.



beauty of design, material and landscaping; there is beauty of interior finish. These things are the details, the perfection of which makes the perfect whole. And yet, after visitors have inspected the exterior and walked from room to room within, their growing admiration seems to center on the equipment as expressing the comfort and convenience of the house—the beautiful bathrooms with their fine appointments; the perfectly equipped kitchen with its modern features for easy and efficient housekeeping. Then, the prospective purchasers

walk down into the basement and commence to exclaim over what they find there. The basement, if well equipped, is a treasure-house of conveniences. As each new feature is inspected, the picture of a perfectly appointed, convenient, modern home grows in the prospects' minds until desire becomes so strong that signatures "on the dotted line" soon follow.

The builder, then, will find it to his advantage to consider carefully all household equipment, studying what attractiveness and sales value it will have when installed in the homes he is planning to build and, at the same time, what influence these features will have on the planning of the house and the layout of the rooms.

Now, the evolution of the modern basement starts with cleanliness, light, and freedom from moisture. The first step towards this end is at the foundation footings. A tile line should be laid around these footings, both inside and out, and connected into the storm drain, in order to carry off surplus water in the ground, which, if allowed to collect, often results in hydrostatic pressure. This pressure, during heavy rains, may easily become great enough to raise and crack the basement floor or force water through both floor and walls.

Waterproofing of the foundation walls is advisable to prevent absorption of water and seepage. All portions of the foundation walls below ground should receive a coating of tar or asphalt. Asphalt is considered best for this purpose and there are excellent waterproofing compounds on the market which have an asphaltic base but mixed with a solvent which enables the brushing of the compound on cold. In this way, the smoking tar kettle and its extra labor expense may be avoided. It

Below: A Popular Basement Den in an Oil Heated Home on Stratford Road, Detroit.



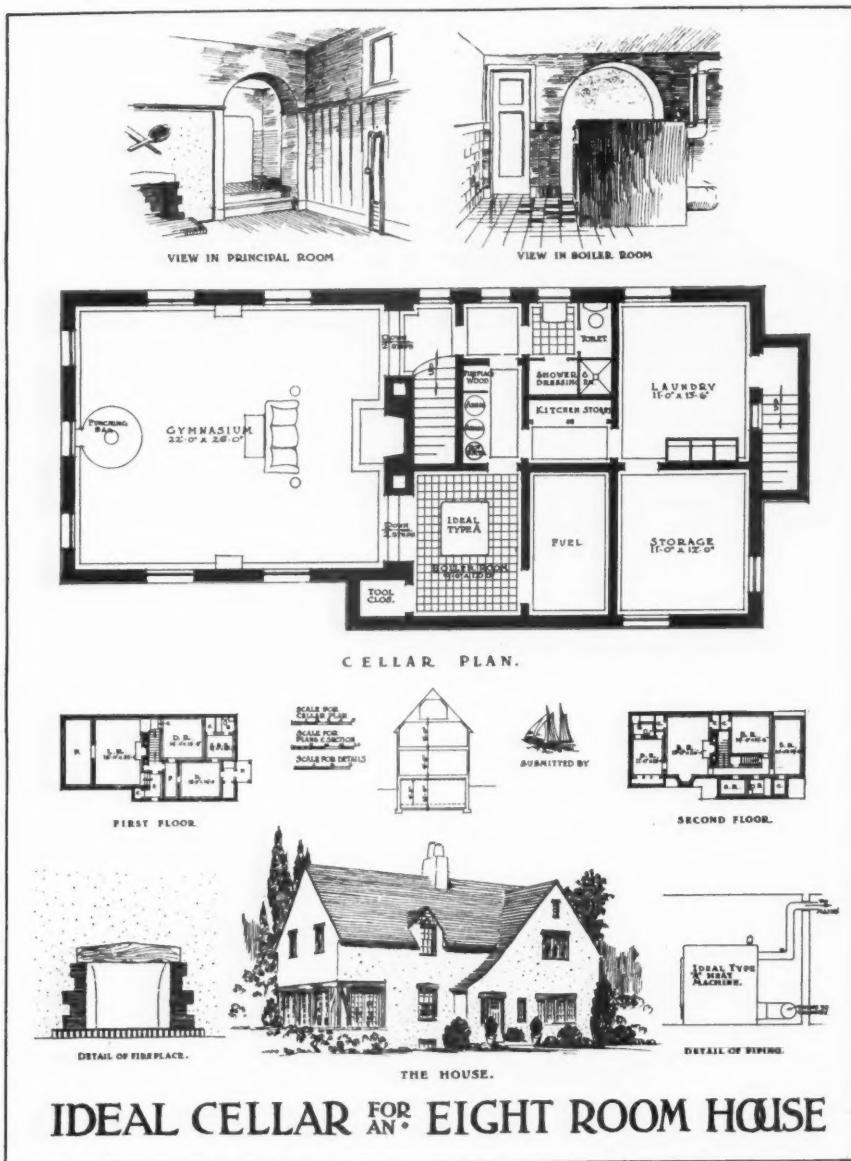
is wise to apply a waterproofing compound of this nature both to the exterior and interior wall surfaces. A heavy compound of this sort constitutes an effective plaster bond when it is desired to plaster direct on the concrete, tile or masonry wall. This plaster bond is a damp-proofing and insures a dry plaster wall which will not sweat. Many builders, however, prefer to fur out with strips and plaster on a lath, fibre or plaster board base, to secure the warmer wall created by the dead air space behind it.

In the best modern basements, the finish, decoration and floors will be fully equal to that in any other portion of the house. Stain, paint and varnish will here find full use. Lacquer is becomingly popular because of its quick drying and easy brushing properties, as well as its superior finish.

The floors of a modern basement should, as a general rule, be equal in every way to other floors throughout the house. The concrete, itself, is an excellent floor and can be made warm with rugs or other floor coverings. Where the concrete is to be exposed, wholly or in part, the use of a concrete floor hardener is advisable. A concrete floor hardener is usually a liquid or a paste which is mixed with the concrete before it sets and has a chemical reaction which prevents dusting and results in a hard, smooth surface which has a better appearance and is easier to keep clean than untreated concrete.

When it comes to floor coverings or finish, there is a wide variety of choice to fit individual needs — linoleum, composition or magnesium flooring, ceramic floor tile, rubber tile, terrazzo, maple, pine or hardwood of any kind. If a wood floor is to be used in a basement, however, it should be laid over strips and the use of a waterproof insulating paper is recommended between the floors. This insures a dry floor which will not warp from moisture.

There are so many features of basement design and equipment worth considering by the progressive builder of today that they will be treated separately in a subsequent article. Among the features to be considered will be gas generators, domestic hot water supply, automatic cellar drainers, coal storage, coal windows, coal boilers and warm air furnaces, furnace fans, domestic stokers, water softeners and water supply systems for outlying suburban homes or country estates and pictures will be shown illustrating some of the more modern basement features.



IDEAL CELLAR FOR AN EIGHT ROOM HOUSE

A Prize Winning Design for Modern Basements, submitted by Hiram A. Salisbury, Omaha, Neb.

So many of the old style basements have been damp and dark, that prospective buyers are quick to note the advantage of the dry, light, livable basement. We have spoken of "full length" casement or double hung windows in modern basements. While not extending all the way to the floor, this description seems necessary to distinguish them from small basement sash. The construction of areaways and installation of large windows in recreation rooms of basements is already established practice. This practice is extending and it will not be long until basements are fully daylighted on all sides. With the English type of basement, most of which is above ground, this, of course, will be an easy matter and has been done extensively.

\$ \$ \$

**"The Modern Kitchen
As a Selling Help"**

will appear in
December American Builder.

The Town House

The Last Word in Apartment Luxury and a Model for Apartment Planning



IN every city there is an important and growing demand for apartment homes offering the maximum in convenience and luxury. "The Town House", recently completed, in Los Angeles, California, is an outstanding example of what the capable builder can do in supplying this demand. At the same time, it may serve as a basic model for some of the less pretentious but equally important apartment projects which the builder undertakes.

"The Town House" was designed and built, as well as being financed and managed by The United Pacific Securities Corporation, of Los Angeles. In planning the new building, it was the purpose of this organization to provide the beauty and distinction of individual homes with the greater convenience and service, as well as the more central location, possible only in multiple dwellings. How well this purpose has been accomplished may be judged from the illustrations on these pages and from a description of the building itself.

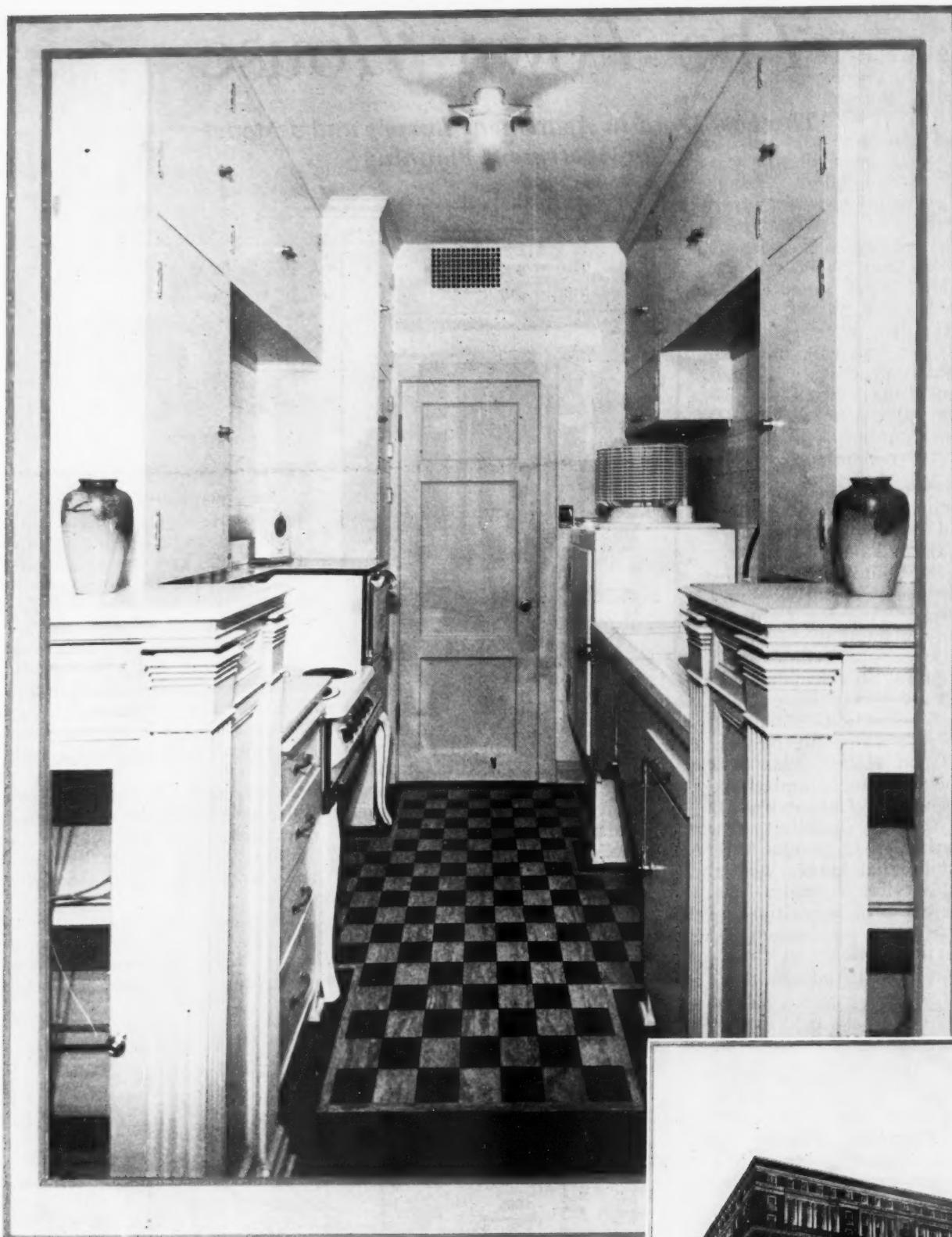
The conspicuous feature of the handsome exterior is a colonnaded entrance facing LaFayette Park. The beauty and dignity of this entrance can be taken as the key note of the entire treatment of the building. The importance of the entrance to any building, no matter whether it be the most imposing of structures or the smallest of homes, is something which can not be overlooked. It is conspicuous in all work which is credited with particular architectural merit.

Within this impressive entrance, on the lower floors, are the essential rooms of general use, rotunda, lounge, restaurant and such, while the floors above are divided into 124 individual apartments. A typical floor plan showing the arrangement of the apartments is reproduced here.

It will be noted that these small apartments do not differ greatly from many others with which we are all familiar. There is the living room, bedroom, bath, and kitchen-breakfast room unit. Certain

A Typical Floor Plan Showing the Arrangement of Individual Apartments in "The Town House" Looks Very Much Like Other Apartment Plans But Close Inspection Shows a Number of Distinctive Features.





Equipment So Complete That Nothing More Could Be Asked Is Found in "The Town House." This kitchenette shows the perfection and real beauty which is carried out even in the "work rooms" of these apartments.



Each Living Room, Throughout "The Town House" Is Provided with a Wood Burning Fireplace.

In the Bathroom, a Glass Enclosure with Sliding Doors Makes a Complete Shower Compartment of the Tub.



features, however, are distinctive. Foremost among these in the provision of kitchen and bedroom entrances from the entrance hall without passing through the living room. This is a point which will be appreciated by anyone familiar with the limitations of many modern "efficiency" apartments.

Another conspicuous feature is the provision of a wood burning fireplace in every living room. While the expense of wood burning fireplaces, with their necessary flues, would be prohibitive in less costly buildings, the fireplace, even though it may contain only a gas log or electric heater, is appreciated by most prospective tenants, and by purchasers who have in mind the appeal of the building they will own.

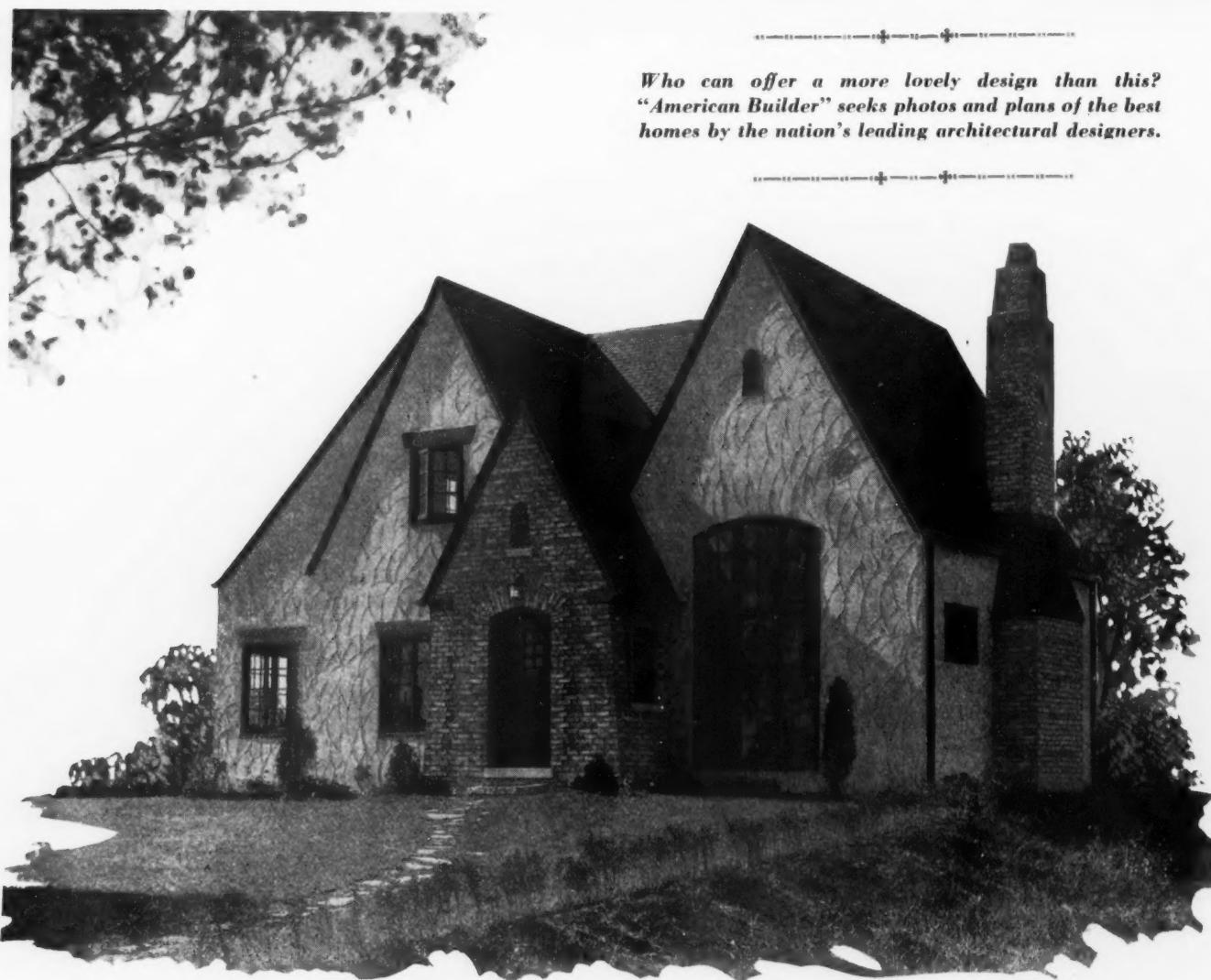
Large windows are provided, measuring almost six feet by 8½ feet, wherever possible. The prospective tenant appreciates well lighted rooms, and sunlight is at a premium in our modern cities. All closets are cedar lined, a nicety possible in moderate priced buildings as well as the more luxurious ones. The bathroom fixtures are chromium plated. The combination tub and shower bath is equipped with a glass enclosure with sliding doors providing a complete shower compartment. Temperature controls are provided in each room. The kitchens are equipped with electric refrigerators.

This latter item is one which may be considered a necessity in any modern apartment building. Tenants expect electric refrigeration and the building not so equipped is placed at a decided disadvantage when it comes to renting and selling. The builders of "The Town House" have selected a refrigerating unit which provides a complete refrigerating plant within each apartment instead of the multiple hook-up type. This was based on the idea that the individual unit provided greater convenience of individual temperature control and greater dependability, as the failure or servicing of one unit would not cause the shutting down of others in the building.

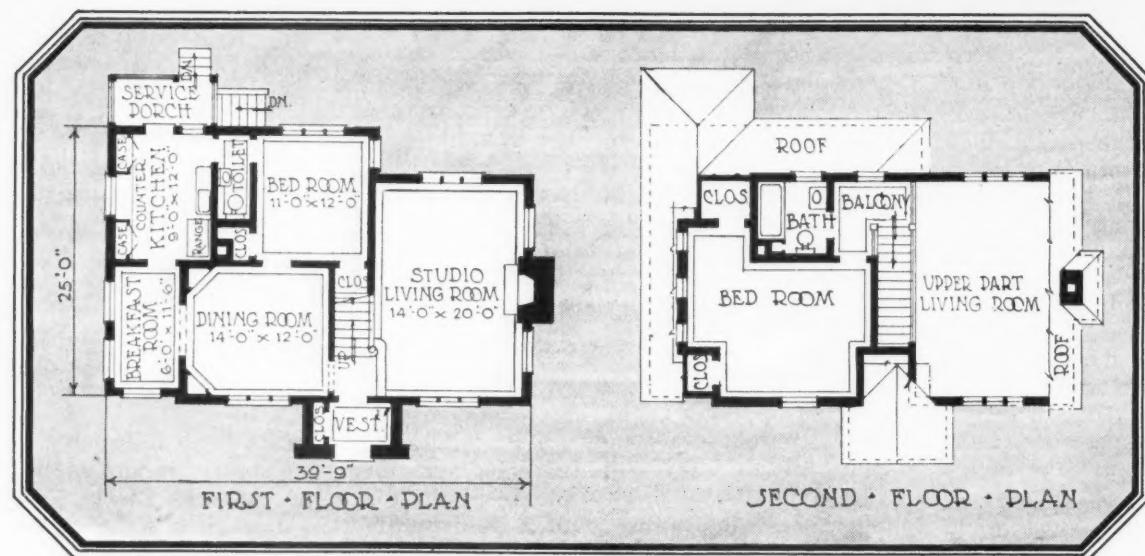
The building restaurant is equipped to serve meals in the individual apartments if desired. To facilitate this service, a chef's pantry is provided for each group of several apartments so that the meals can be delivered from steaming hot chafing dishes promptly and in perfect order. There are also private dining rooms in connection with the restaurant. Tenants may have dinners prepared in their apartment by a chef furnished by the building management, a butler to serve and a maid to attend to the necessary kitchen and dining room work.

An elaborate system of push buttons is installed in each apartment so that it is not necessary to phone to the office for various services. The touch of a push button calls a maid, has the owner's automobile delivered at the door or any of various other services. More than an acre of private grounds is provided for the enjoyment of the tenants.

While not all these perfections of detail can be carried out in the average apartment, they are indicative of a purpose in design which is widely adaptable. In the design of "The Town House" a distinct effort has been made to provide real homes in an apartment building and this same thing may be done with profit by builders of apartment buildings of all classes.



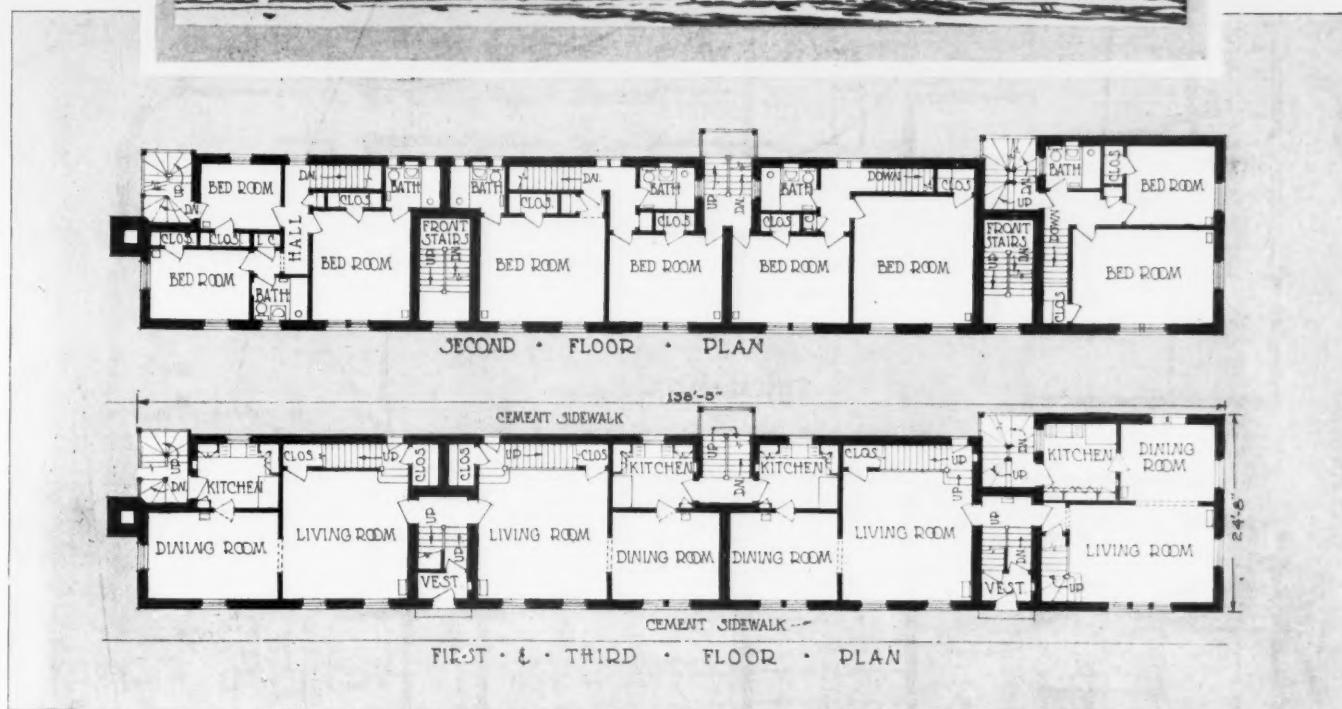
*Who can offer a more lovely design than this?
"American Builder" seeks photos and plans of the best
homes by the nation's leading architectural designers.*



LARGE ROOMS IN SMALL HOME

*Perfection in a few rooms, entirely adequate for a small family,
was the aim in planning this charming English type cottage*

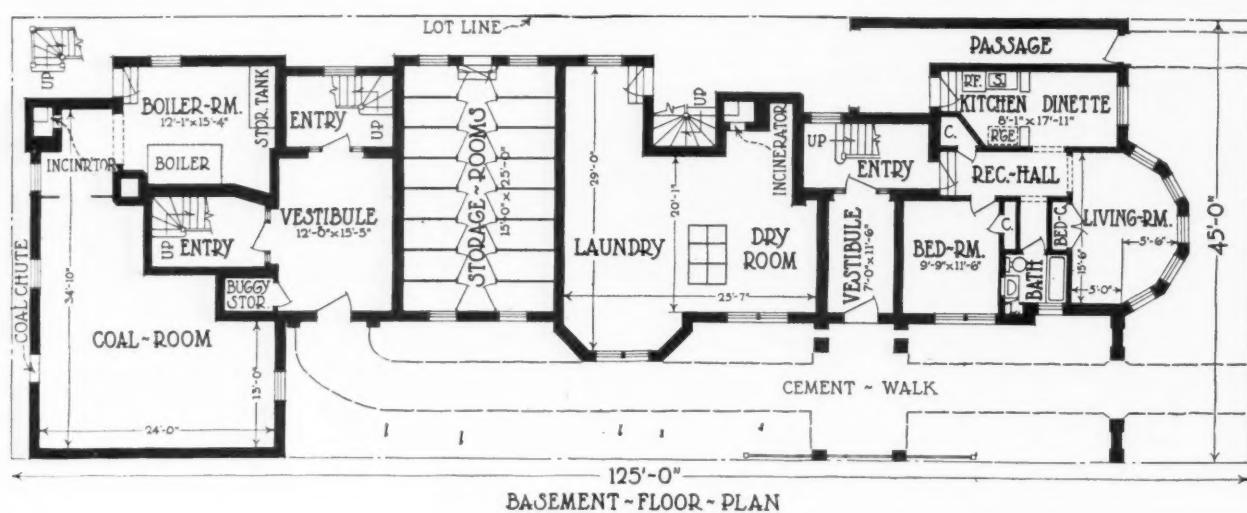
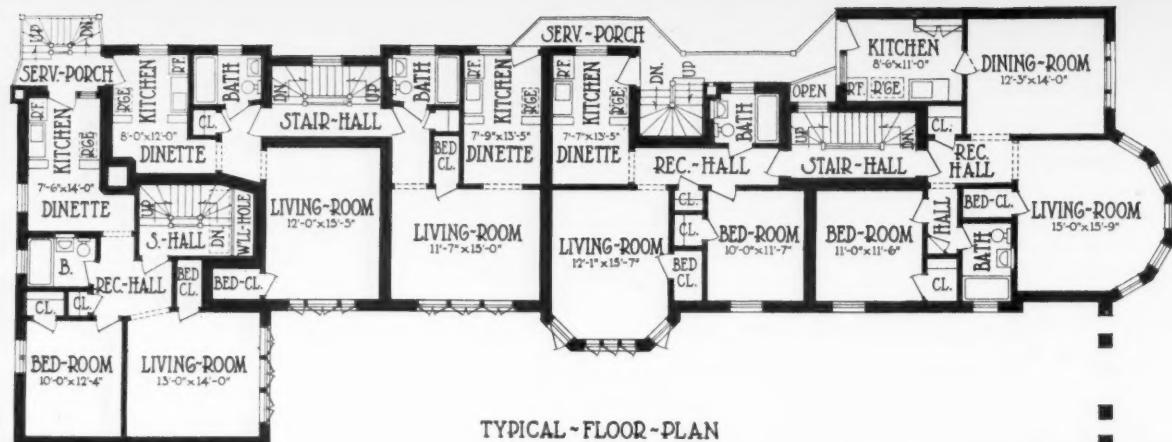
ALLEN E. ERICKSON, Chicago, Architect



UNIQUE DOUBLE DUPLEX

The four stories of this long and narrow building provide in effect two 2-story homes, one above the other

C. W. LAMPE & CO., Chicago, Architects



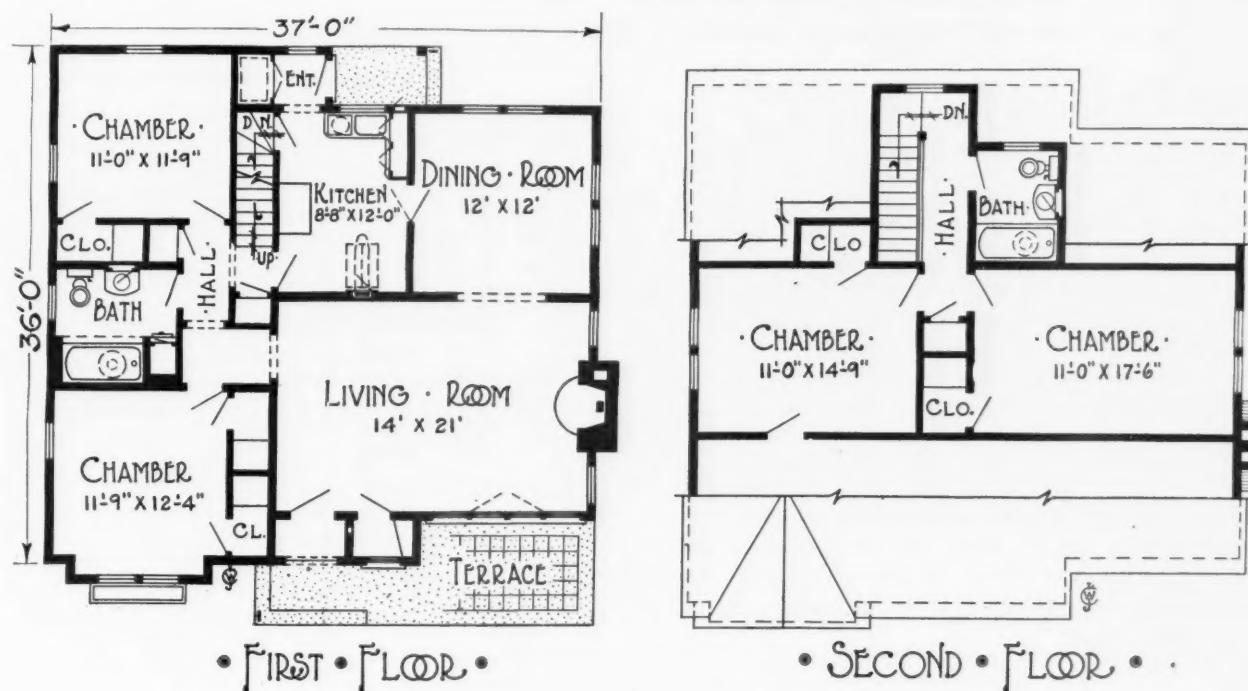
THE JEFFERSON APARTMENTS, No. Central Park Ave.

CHARLES P. RAWSON, Chicago, *Architect*



NOW THE SEMI-BUNGALOW

Bungalow Convenience with Two Extra Bedrooms on the Second Floor, a Plan Which Makes a Strong Appeal to Prospective Owners





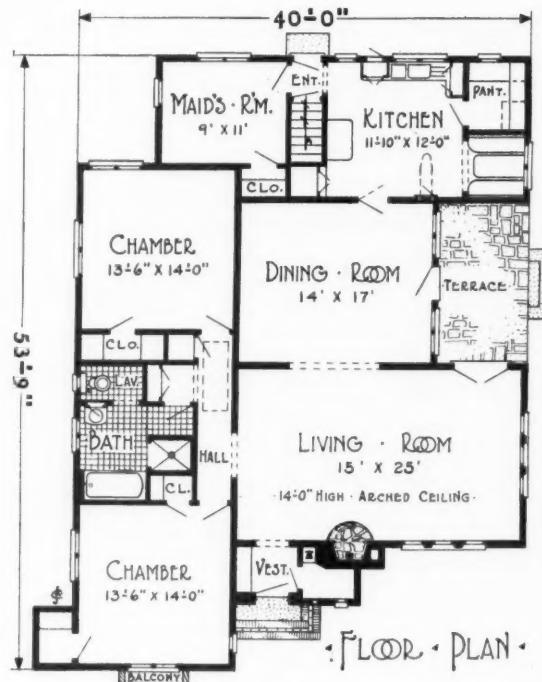
A COZY SHINGLED COTTAGE

The Convenience of One-Story Living Is Here Combined with the Exterior Charm of High Gables and Steep Roof Lines

SERVICE TO HOME BUILDERS

Throughout this magazine we present many building designs. A variety of home plans are included, selected from many parts of the United States and designed by various architects of standing.

The "American Builder" will gladly serve its readers by bringing them together with these architects if any further information or plans are desired for any of these designs. Address the American Builder Home Planning Service, 105 West Adams Street, Chicago, or 30 Church Street, New York City.

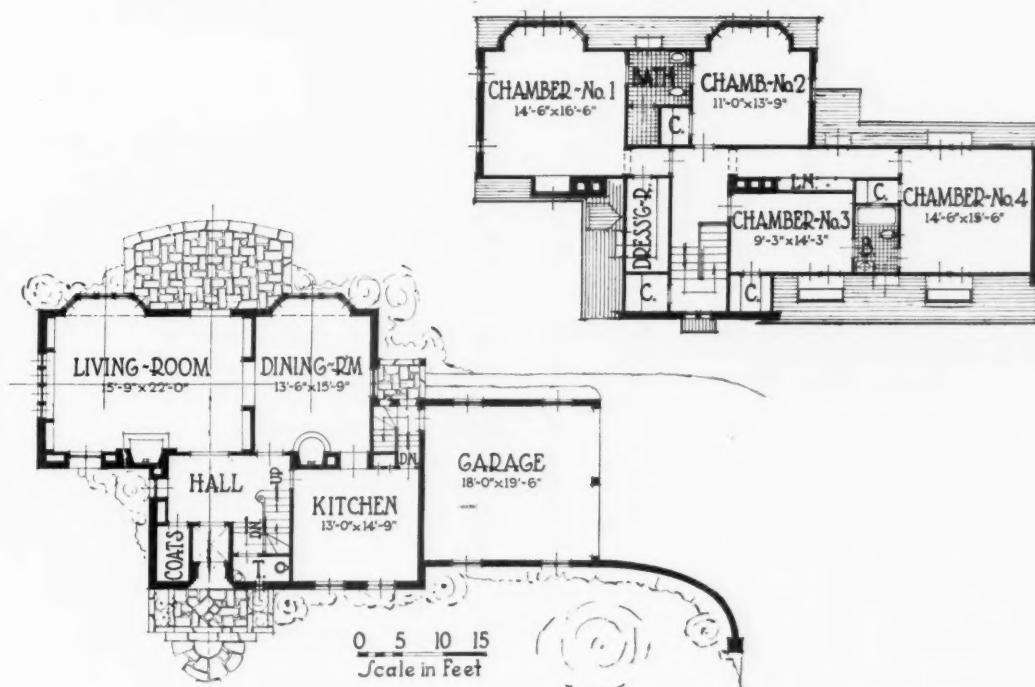




ALOYS FRANK HERMAN, INC., Detroit, Mich., *Architect*

AN IDEAL SUBURBAN HOME

*Nestling Close to the Ground with the Air of Having
Sprung from the Soil Rather Than of Being Built by Man*





WITH TWO-STORY LIVING ROOM

The High Living Room with Its Balcony Gives a Sense of Spaciousness So Often Lacking in This Day of Compact Designs

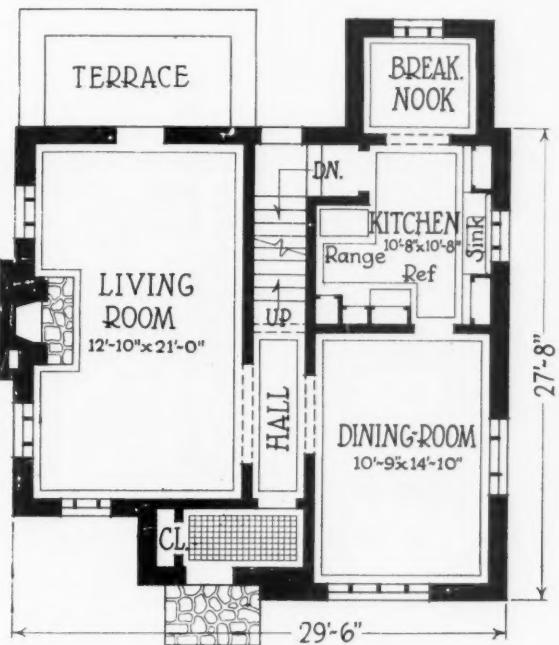




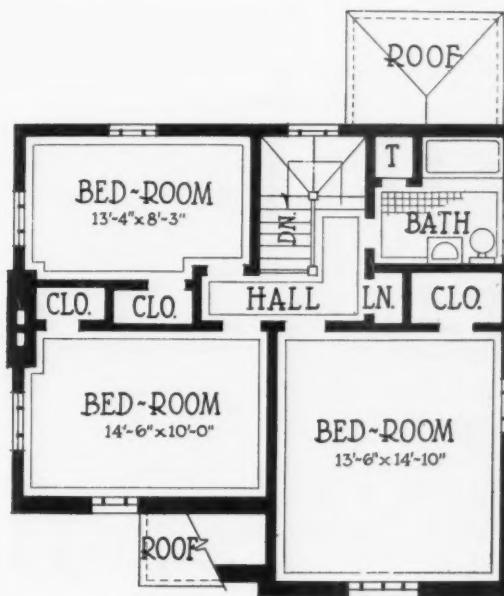
PALMER PLAN HOMES, INC., Detroit, Architects and Builders

IT SHOULD SELL QUITE READILY

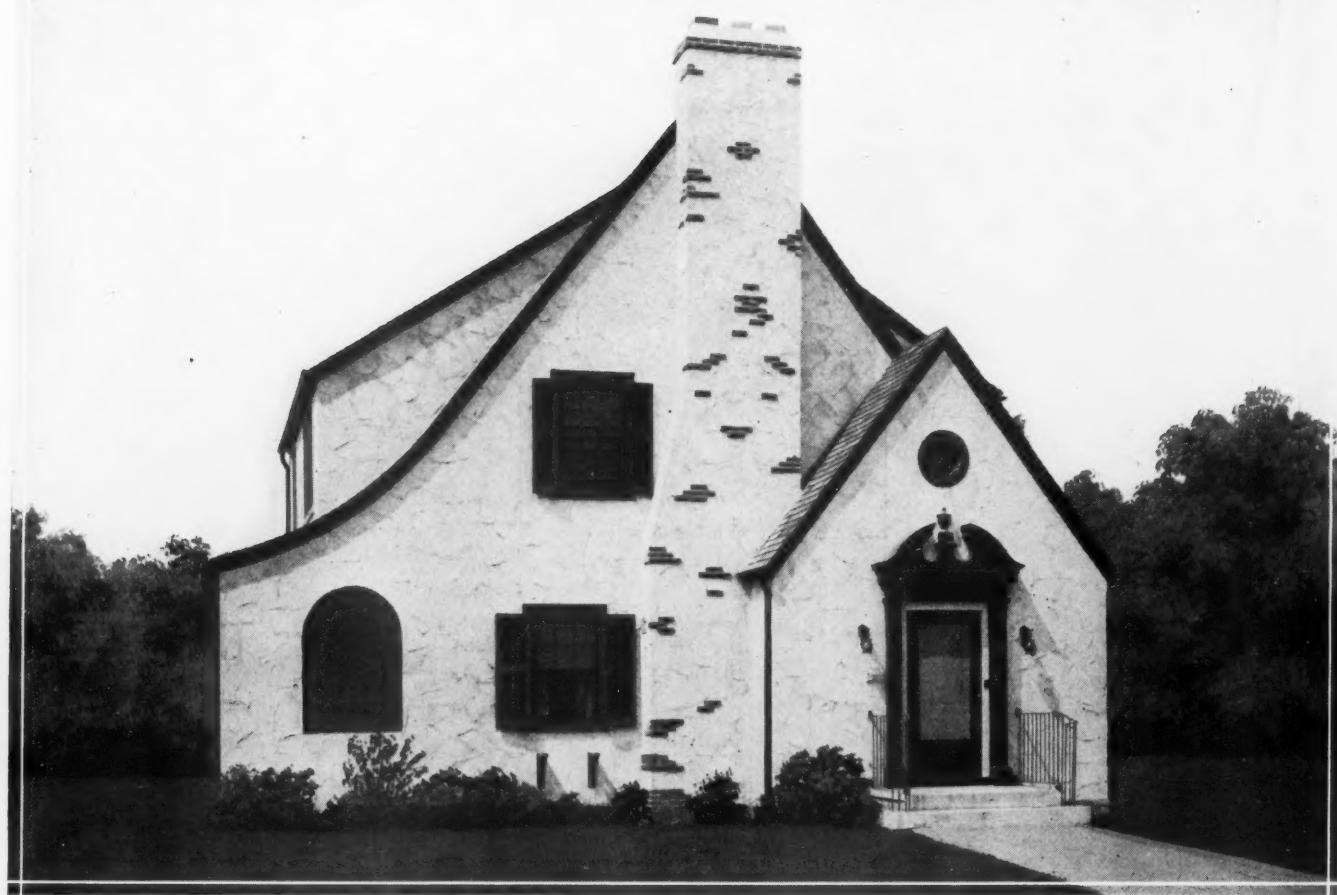
*Good Design, Quality Construction and a Plan Suited to the Needs
of the Average Family as Understood by a Highly Successful Builder*



FIRST-FLOOR-PLAN

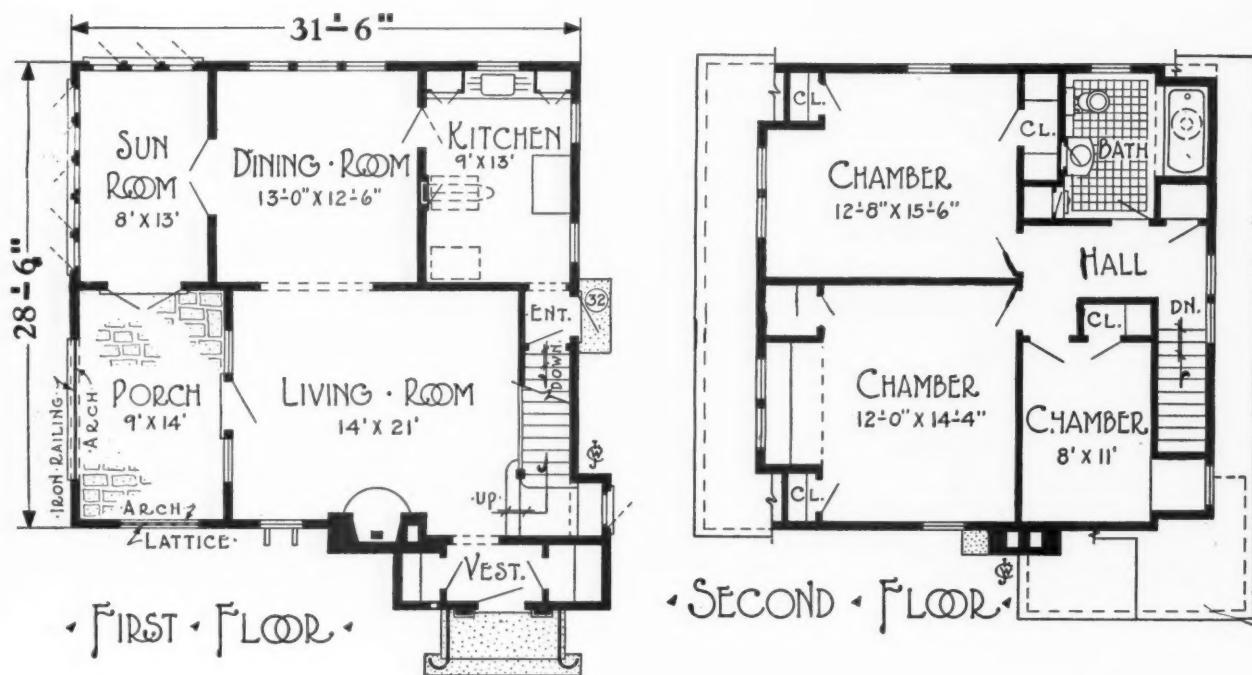


SECOND-FLOOR-PLAN



STUCCO WALLS AT THEIR BEST

*Six Rooms and a Sun Room, Just Right for the Average Family
and a Home That Anyone Might Well Be Proud to Own*





PALMER PLAN HOMES, INC., Detroit, Architects and Builders

THE BEAUTY OF GOOD TASTE

The Simple New England Colonial, Always in Good Taste When Done by a Competent Designer and Builder, Offers Much for Its Cost





HILLER BROS., Portland, Ore., Architects and Builders

THATCHED ROOF CHARM

The Impractical Thatch of Old England Is Replaced by Practical Modern Shingles But the Thatched Effect Is Retained in This Home





Builders

THE AMERICAN BUILDER ALL-FEATURE HOME

Complete Working Plans

*Popular Elizabethan Half-Timber Home Fully Presented in
One-Eighth-Inch Scale Drawings*

A VERY clever, quick-selling home design is illustrated on this page and its construction fully explained in the drawings on the four pages following. This design has been worked out by the architects of the AMERICAN BUILDER Editorial Staff with the idea of gathering together in one small home all of the good modern features, at the same time providing for such a simple straight-forward arrangement that true economy would result.

The plan is 26 by 28 feet on the ground. The first floor is divided into a large living room, taking up half the area, and the other half divided equally between the dining room and the kitchen. On the second floor there is one extra large bed room and another bed room of good size, a conveniently placed bathroom and plenty of closet space. Some usable space on the third floor is also available,

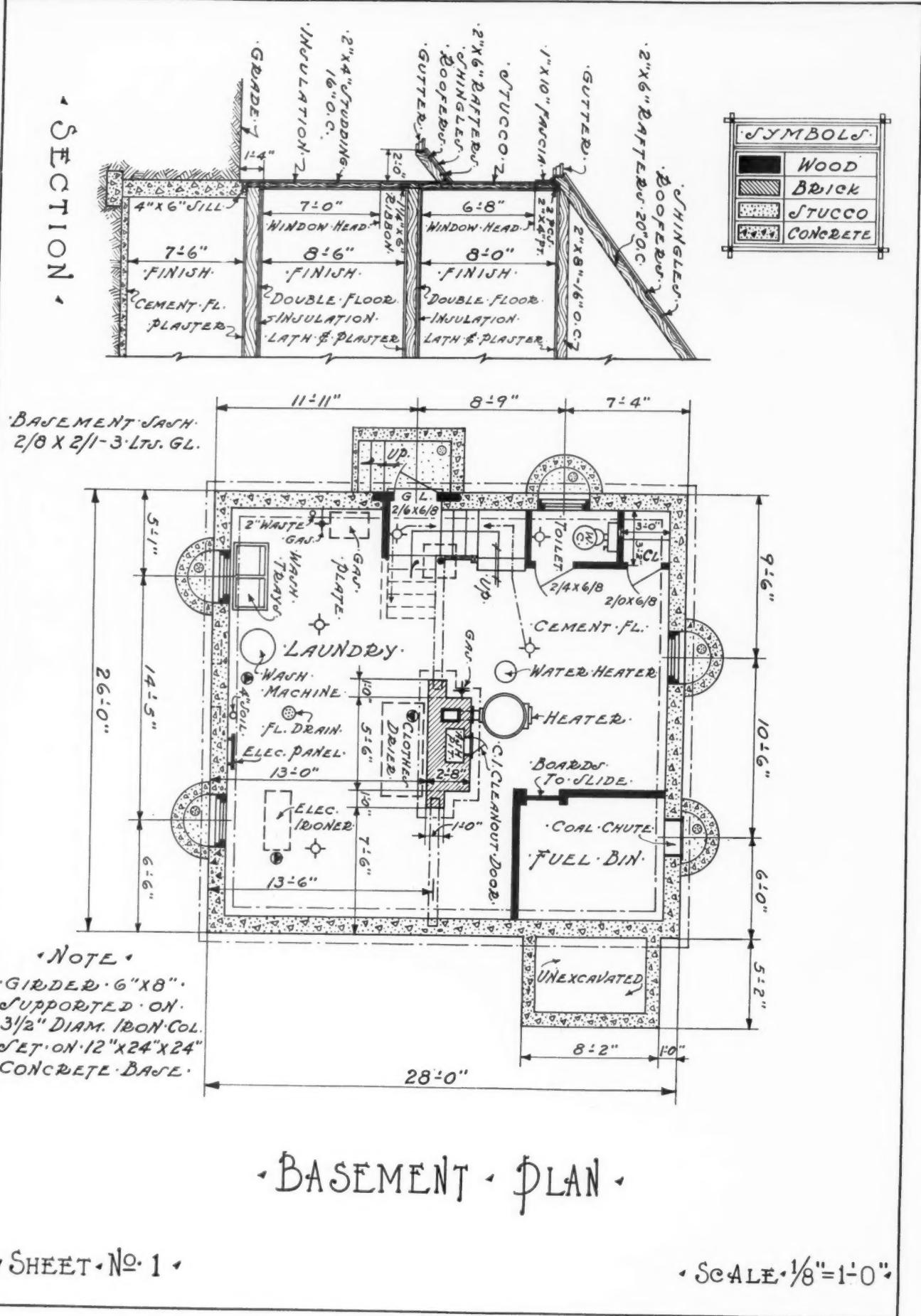
a commodious stairway going up from the upper hall. This little house has a decided English air; with its steep roof, broad dormers, and tasteful use of exposed timbering. The walls are of portland cement stucco on metal lath over insulation. An alternate construction method would make use of hollow tile or concrete blocks to carry the stucco finish. The roof can be of natural slate, rigid asbestos, or of asphalt shingles, in colors to suit the preference of the builder.

Notice on the basement, first, and second floor plans, our architects have indicated the important items of labor-saving home equipment without which, these days, no home is complete. Some of the items, of course, can wait until later but proper place for each should be provided at the time the plans are drawn and the home built.

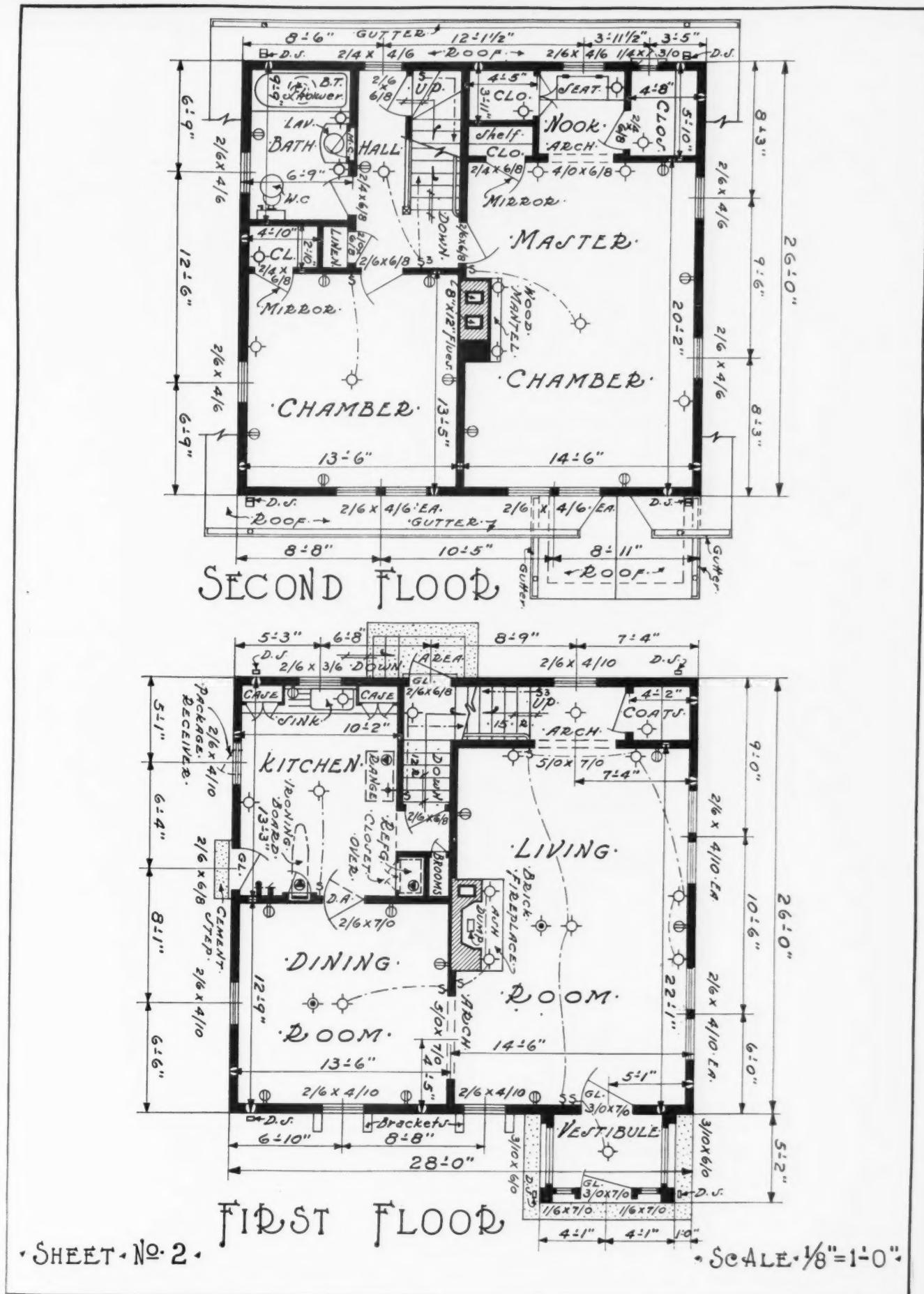
NEXT MONTH

Complete Plans of 6-Room
Brick Bungalow, Modern
in Design.

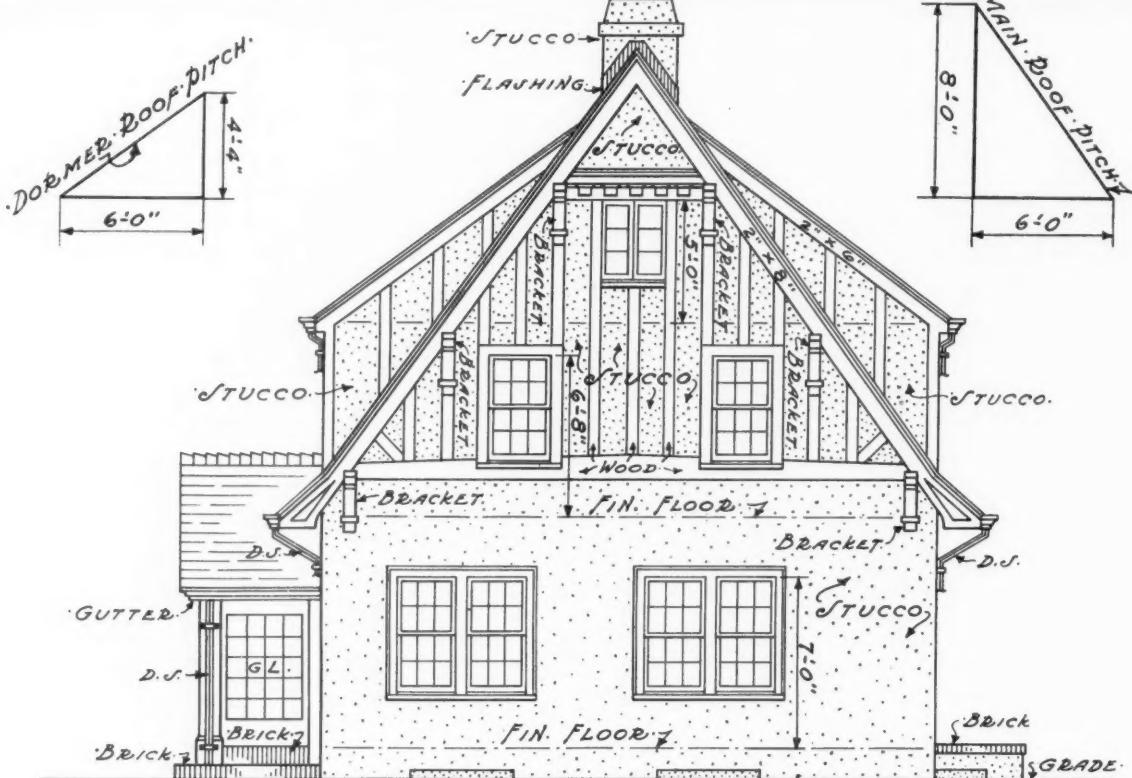
SECTION *



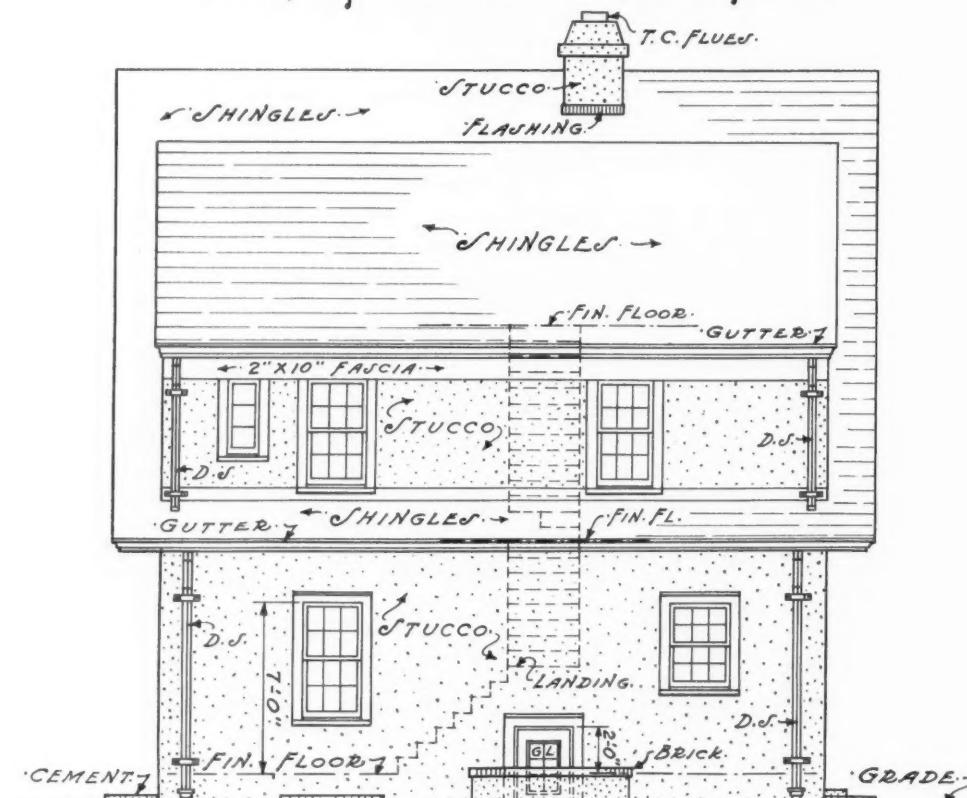
A Well Lighted Basement Is Assured This All-Feature Home by the Area Ways in Front of Each Window. Only 28 feet wide, this is a good design for the average narrow city lot.



Notice How Every Bit of Space Is Utilized in This Plan; a Raised Blanket Closet Is Worked in Above the Main Stair Without Sacrificing Head Room. Elevations follow.



• RIGHT • SIDE • ELEVATION •

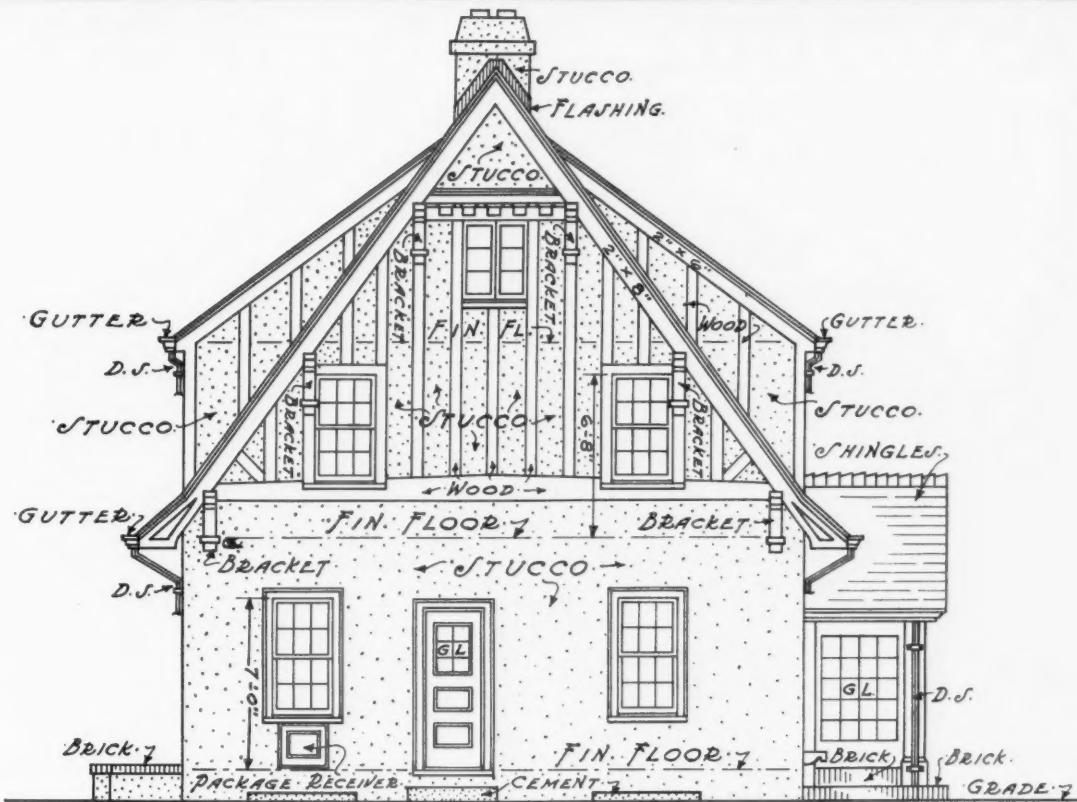


• DEAD • ELEVATION •

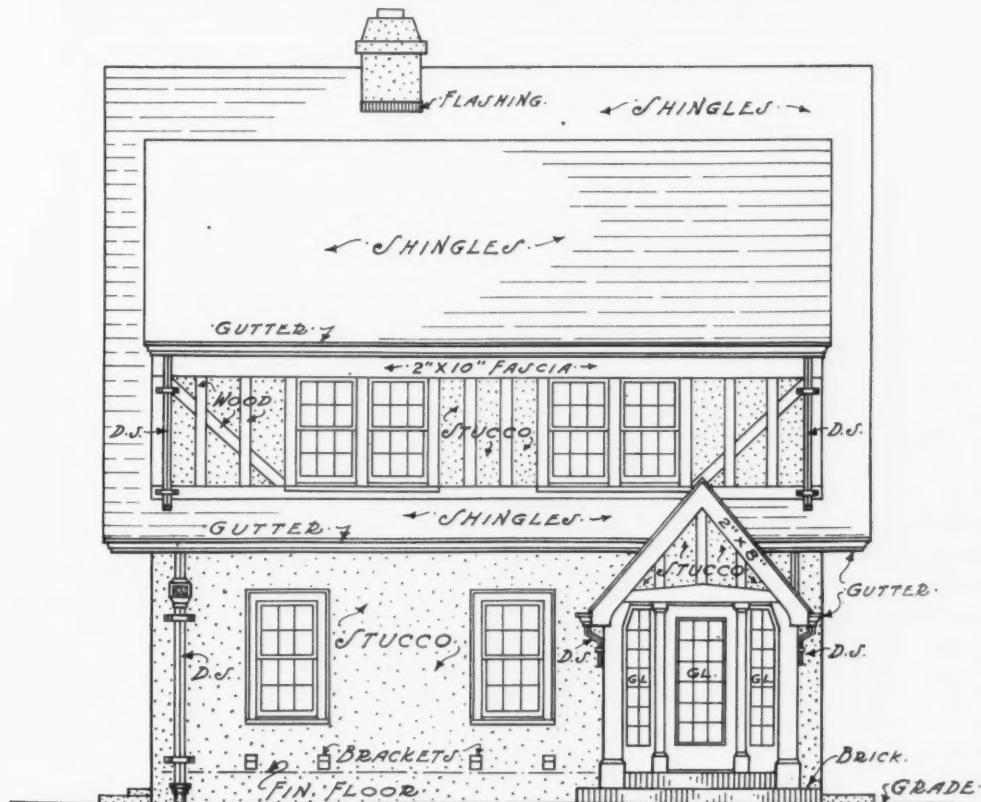
• SHEET • NO. 3 •

• SCALE • $\frac{1}{8}'' = 1'-0''$

The Elevation Drawings of the November All-Feature Home Bring Out Its Crisp, Clean Lines and Graceful Roof Slopes. Stucco of light tint with darker trim is pleasing.



• LEFT • SIDE • ELEVATION •



- FRONT ELEVATION -

• SHEET • N^o. 4 •

- SCALE - $\frac{1}{8}'' = 1'-0''$

All Sides of This Little Home Are Equally Presentable, Making This a Good Corner-lot House. It can be built well at low cost and always is a ready seller.

Decorating and Furnishing the All-Feature Home

Recommendations by KATHRYN E. RITCHIE

Assisted by the Decorative Dept., Marshall Field & Co.

THE most appropriate style of interior decoration for a small or medium-sized house of the English type is the Eighteenth Century Georgian, a style which developed during an age in England when social life and conditions were in many respects akin to our own. It is a style which is especially well adapted to small scale rooms since it calls for furniture of moderate size and weight. Grace, charm, refinement and perfect taste are the qualities which the Georgian style imparts to a home furnished according to its dictates.

It may not always be possible or practical, of course, to adhere too strictly and literally to every detail of this type of decoration. Modifications and adaptations may always be made, but the general spirit of the style should be preserved by observing its more important features.

Panelled walls, for instance, painted white, cream or any delicate shade are typically Georgian. As an alternate, however, where paneling is not practical, plain plaster walls in any neutral color or painted pale yellow, blue-green, salmon, peach or whatever shade is desired, are equally good and carry out the spirit of the style. Wallpapers may also be used provided they are of the right kind — light colored diagonal-patterned or striped paper for bedrooms; scenic papers depicting hunting, rural, architectural and historic scenes for halls, living-rooms or dining-rooms.

Ceilings are usually flat plastered and plain, and may be tinted to harmonize with whatever color is used for the walls, but should always be a shade or two lighter so as to reflect light down into the room. Hardwood floors of oak are widely used, or floors colored to harmonize with a chosen color scheme. Or they may be entirely covered with all-over carpeting.

Typical furniture of the Georgian period includes the styles developed by the greatest masters of furniture design ever known in England—Chippendale, Hepplewhite, the Adam brothers, and Sheraton. It is singularly graceful and delicate in feeling, combining beauty and charm with utility and comfort, and is of a type which appeals especially to those who appreciate the finer things of life and demand a certain degree of elegance and comfort in home surroundings.

To Right: An Attractive and Inviting Fireside Grouping Which Creates an Atmosphere of Ease and Comfort.

The work of each of these great designers and cabinet-makers has its distinguishing characteristics. Space does not permit the enumeration of them but they may be studied by those who are planning a Georgian interior in the many excellent books dealing with period furnishings in our libraries today. Georgian furniture includes arm chairs and straight chairs; great comfortable wing chairs; a variety of tables such as consoles, piecrust, tilt-top coffee and tea tables; sofas, graceful settees, secretaries, four-post beds, dressing tables, wash stands.

No one type of furniture, such as Sheraton or Hepplewhite, need be used to the exclusion of the others, throughout the house. The pieces may be pleasantly intermingled, and the furniture of one designer combined with that of another provided they are similar in feeling. The living-room in the accompanying illustration, for instance, shows a small Sheraton sofa and an Adam side chair combined with a William and Mary highboy and a Queen Anne wing-chair and coffee table. The result is entirely



harmonious and very pleasing.

This living-room illustrates other feature of the Georgian style which is a balanced or symmetrical arrangement of furniture and accessories, the two small tables on either side of the fireplace, for instance; the pair of lighting fixtures above the mantel, the two little figures on the shelf.

The window hangings for this type of house usually consist of glass curtains of some light material such as net, or plain or silk marquisette, with over-curtains of damask, silk repp, moire, hand-blocked linen, or chintz in bright colors and strong patterns. The latter should either hang straight to the floor or be looped back,



Below: A Dining-Room Showing Typically Paneled Georgian Walls. Beautiful draperies and colored Venetian glass are used in carrying out an effective color scheme.



Above: A Georgian Bed-room. Simply Furnished, But Having an Air of Elegance and Richness.

To Left: A Georgian Living-Room Where Beauty and Charm Are Combined with Utility and Comfort.

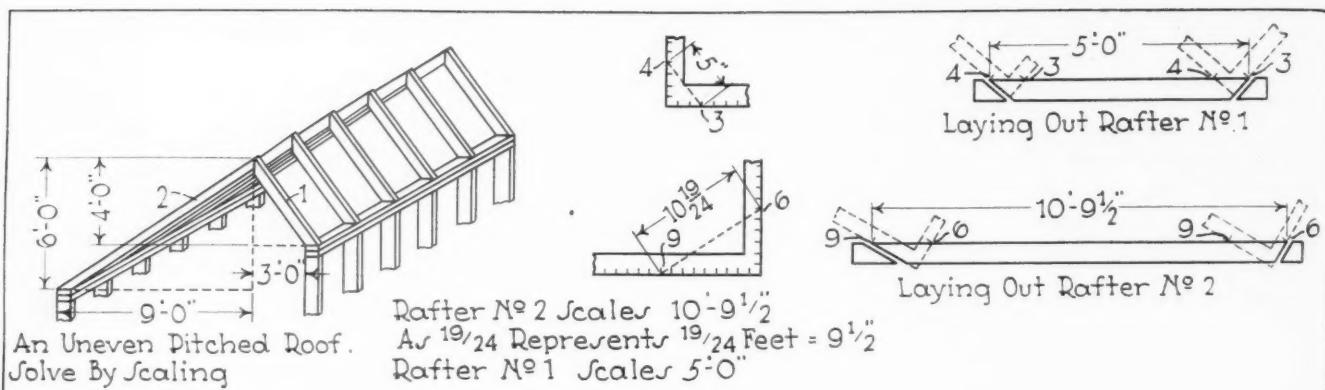


and may be used either with or without valances.

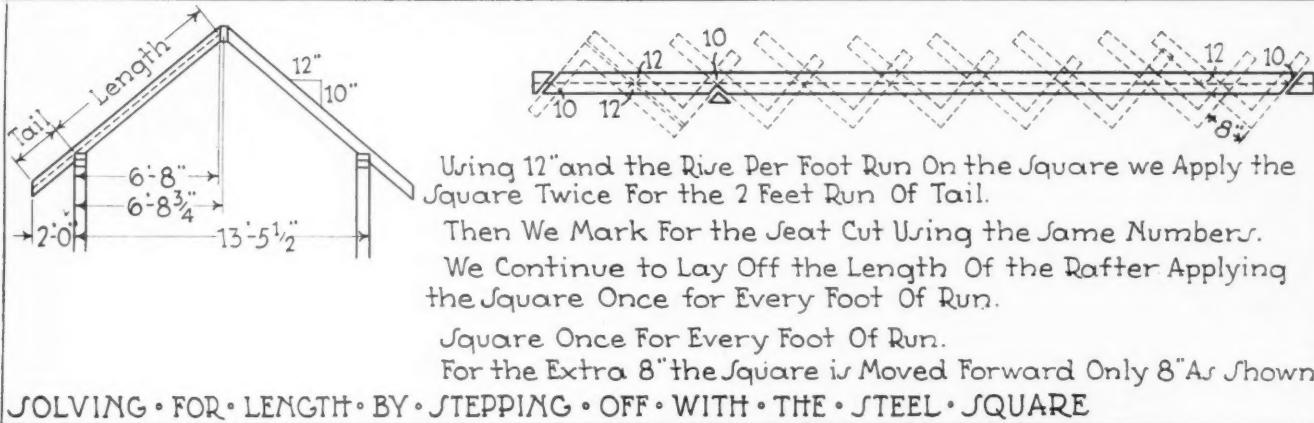
The accompanying illustrations contain suggestions for the three principal rooms of a house, living-room, dining-room and bedroom. The color schemes employed should be carefully studied. Their use will create an atmosphere of cheer and beauty.

The walls of the living-room, for instance, are peach-colored; the draperies of gray-green moire; the sofa is covered in a brocade having a rust background.

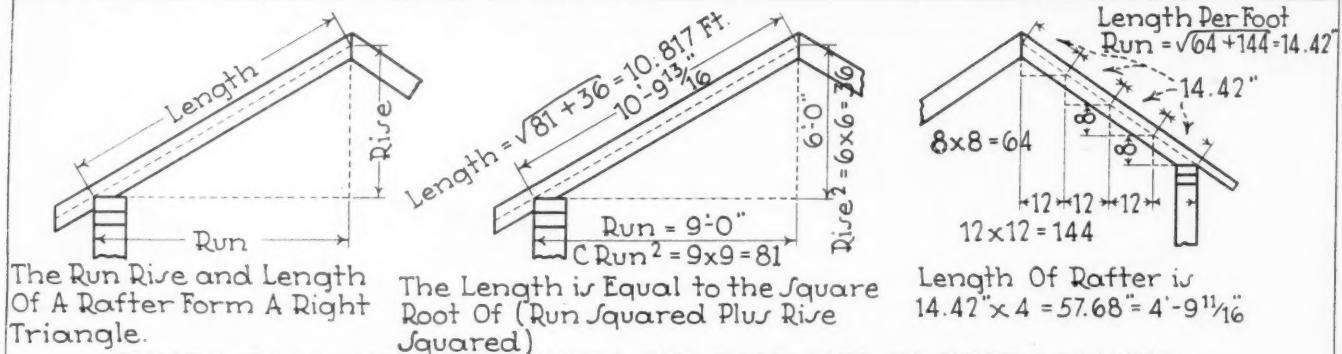
The dining-room shows simple panelling used on the walls, painted in light blue flat paint. The over-curtains of cretonne having a peach-colored background with blue and rose.



SOLVING • LENGTH • OF • Rafter • BY • SCALING

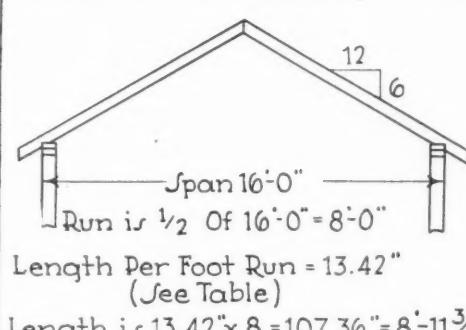


SOLVING • LENGTH • BY • STEPPING • OFF • WITH • THE • STEEL • SQUARE

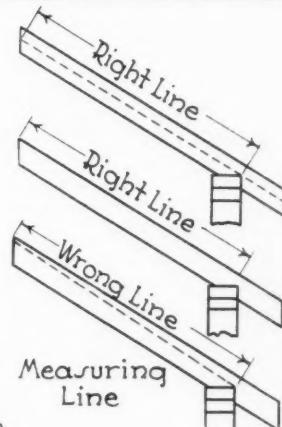


SQUARE • ROOT • AND • THE • LENGTH • PER • FOOT • RUN • IN • ROOF • FRAMING

PITCH		LENGTH PER FOOT RUN		
RISE	RISE PERFOOT	BY DEGREES	IN INCHES	IN FEET
1/8	3"	14° 02'	12.37	1.03
1/6	4	18° 26'	12.65	1.054
5/24	5	22° 37'	13.00	1.083
1/4	6	26° 34'	13.42	1.202
7/24	7	30° 15'	13.89	1.158
1/3	8	33° 41'	14.42	1.202
3/8	9	36° 52'	15.00	1.25
5/12	10	39° 48'	15.62	1.302
11/24	11	42° 31'	16.28	1.356
1/2	12	45° 00'	16.97	1.414
13/24	13	47° 17'	17.69	1.475
7/12	14	49° 24'	18.44	1.536
5/8	15	51° 20'	19.21	1.601



USING • TABLES • TO • SOLVE • FOR • THE • LENGTH • OF • RAFTERS



The Various Ways of Obtaining the Length of Rafters—See explanation on the page opposite.

Finding Length of Rafters

Continuing Our Course in Roof Framing Simplified—Diagrams on Page Opposite

By JOHN T. NEUFELD

OUR last discussion centered itself on the method of designing the slope of the roof, usually called by the mystical name "pitch" (a rather sticky substance). This lesson will be devoted to the problem of finding the length of rafters.

It is the intention to show side by side the various methods of finding the length of rafters. Four methods are illustrated in the drawing on the opposite page. These we will designate as follows:

- "Scaling the length."
- "Stepping off the length."
- "Figuring by square foot."
- "The length per foot run method."

Scaling the Length of Rafters

A very simple and yet practical method is to scale the length of rafters on the steel square. This is illustrated first in our drawing. Generally the number representing the run of the rafter is taken on the square and the number representing the rise is taken on the tongue; thus in the example the run of rafter number 2 is 9 feet, and the rise is 6 feet. Therefore we scale the distance between the 9 and the 6 on the square. The distance is 10 and $\frac{1}{2}$; here each inch represents one foot and each twelfth of an inch represents one inch. We should therefore use a rule divided into twelfths. Usually a steel square has one edge graduated into twelfths.

Stepping Off the Length with the Square

In the second part of the drawing we show how the length of a rafter may be stepped off with the square. First the rise per foot run must be known. In the example given the rise is 10 inches per foot run. The illustration shows how a measuring line is drawn along the center of the rafter or rather through the point coinciding with the edge of the plate, from which all measurements are usually taken. The measuring line helps the beginner to avoid such mistakes as shown in the illustration at the lower right hand corner of the opposite page.

Apply the square along the rafter so that the numbers 12 and 10 come on the measuring line (or the edge of the rafter may be used). The square is moved forward once for every foot

of run. This is very similar to laying out the stringer of a flight of stairs. When applying the square a mark is always made at the point where the 10 on the tongue falls, then the square is moved forward until the twelve coincides with this mark. It can readily be seen that it requires accurate work.

Figuring by Square Root

This method is quite accurate but not used very much because of the difficulty that most mechanics have with extracting the square root of a number. We will therefore not dwell on this method very long but will mention the principles involved so as to give those that know square root the benefit. The third part of our drawing shows how the run, rise and length of a rafter form a right triangle. To find the length of the long side of a right triangle we square both sides and add them together, then we extract the square root from this sum and the answer is the length of the long side. To find the length of the rafter we square the run and also square the rise; then we add the products together and extract the square root; the answer is the length of the rafter. See example on opposite page.

Length per Foot Run

The "length per foot run" of a rafter varies with the pitch just as the length of the rafter varies. The length per foot run must be figured out by the square root method as shown in the illustration, but it is not necessary to figure these lengths out every time a rafter is figured. The length per foot run for the various pitches can be figured out and put in table form, this table to be used for calculating rafter lengths. The tables of all kinds can be found in handbooks or on steel squares. To find the length of the rafter using such a table the length per foot run is multiplied by the run taken in feet. Example:

What is the length of a rafter for a building 28 feet wide with a 9-inch rise per foot run?

Solution:

The run is $\frac{1}{2}$ of 28 equals 14 feet.

Table gives the length per foot run as 15 inches.

Length is 15×14 equals 210 inches or $17\frac{1}{2}$ feet.

The table illustrated also gives the pitch by degrees.

PROBLEMS AND ANSWERS

(1) A rafter has a 7-inch rise per foot run and the building is 18 feet wide. Give the numbers to be taken on the square and the number of times it must be applied to step off the length of the rafter.

(2) What is the length per foot run for each of the following rafters:

A rafter for a $\frac{1}{3}$ pitch roof?

A rafter with a 12-inch rise per foot run?

(3) What would be the rise per foot run for each of the following rafters?

A rafter with a run of 16 feet and rise of 8 feet;

A rafter for a roof 20 feet wide and a total rise of 10 feet.

(4) Find the length of a rafter with $5/12$ pitch and 16-foot run.

(5) What is the pitch in degrees for each of the following roofs:

A roof 24 feet wide and 9 feet high?

A roof with a 7-inch rise per foot run?

A $7/12$ pitch roof?

(1) Use numbers 7 and 12 and apply the square 9 times.

(2) Length per foot run for $\frac{1}{3}$ pitch is 14.42 inches.

Length per foot run for a 12-inch rise per foot is 16.97 inches.

(3) If the run is 16 feet and rise is 8 feet then the rise is 6 inches per foot run.

If the span is 20 feet and rise is 10 feet then the rise is 12 inches per foot run.

(4) Length is 15.62×16 equals 249.92 inches or 20 feet $9\frac{1}{8}$ inches.

(5) The pitch in degrees for a roof 24 feet wide and 9 feet high is $36^\circ 52'$.

The pitch in degrees for a roof with a 7-inch rise per foot run is $30^\circ 15'$.

The pitch in degrees for a $7/12$ pitch roof is $49^\circ 24'$.

What of the Refrigerator?

By ROBERT McKNIGHT

*Director of Public Relations
National Association of Ice Industries*

NOT so long ago an ice refrigerator was just an ice box; few of them were much more efficient than packing cases, though slightly more expensive. But nobody cared. Architects, builders and home owners usually got the cheapest boxes they could get and those that had no ice boxes stuck their food on the window sill between meals, or down in the cellar, and let it go at that.

Most householders didn't know much about refrigerators and refrigeration; nor did most architects or builders; nor did most ice men, for that matter. An ice box was an ice box—and that was that.

But now conditions have changed. The public is becoming refrigeration conscious. So are architects and builders. And so have the ice men. No need to go into the causes here?—a long, though interesting story; the fact is that refrigeration and refrigerators are matters of live interest to everybody today and the average high school lass knows more about them than her grandma ever lived to learn—or cared to know.

It is doubtful if there is a more alive and alert industry today than that formed of the ice producers and distributors. Uninformed folk think that the awakened ice industry is fighting for its life, but the truth of the matter is that it is extending its market with new zest because convinced by four years competition with substitutes for ice, that its future is even more golden than its prosperous past.

The ice industry is busy studying its problems, improving its service, applying sound merchandising principles, increasing its business, increasing its profits. Founders of ice companies are being succeeded by energetic, college-trained sons; small companies are being merged with large ones; power companies are acquiring and building ice plants; in Oklahoma and Arkansas ice is a public utility, subject to beneficial state regulation.

Over \$1,000,000,000 is invested in America in ice plants. In 1928 over 60,000,000 tons of ice were produced and distributed in this country, valued at \$432,000,000—an increase in tonnage of 8 per cent, an increase in money value of 15 percent, over 1927. Last year broke all records but 1929 is expected to surpass it.

The ice industry does 95 per cent of the refrigeration business of the country. Every man, woman and child depends upon ice in some way in his daily life: Food is ice-cooled in refrigerator cars, in stores, in hotels and restaurants—somewhere along the route to the table—if not actually in the home, for less than 50 per cent of the population have any home refrigeration at all, other than window boxes, cellars and other primitive makeshift methods.

A \$432,000,000 business each year with 50 per cent of the potential market undeveloped—that is the future that enthuses the ice man, making him hit the ball with added vim and vigor.

No need to go into the details of the ice man's rejuvenation here, interesting though the long story is—how he is modernizing his business from plant out; how he is teaching his delivery men to be salesmen, uniforming them neatly and teaching them to

be smiling, courteous and well-informed; how he is using scoring machinery to guarantee the weight of his ice; how he is making and selling crystal-clear ice cubes; how he is educating his customers to the qualities of ice as a refrigerant. It is sufficient to say that he is doing these sensible things and many more and steadily increasing his business.

UN TIL he began to investigate and study, the average ice man knew little more about his product than the average housewife. But now he has learned these three great advantages of ice for food preservation:

1. It is purifying. Food odors are absorbed by the melting ice film and eliminated through the ice box outlet. This goes on all the time, every hour of every day.

2. It protects flavor. It maintains proper atmospheric balance of cold air, dry air, moist air and pure air to preserve food juices and flavors.

3. It is cheap. A survey of 20,000 ice bills shows an average year-round cost per home of \$3.54 a month, with no other investment than the cost of a refrigerator.

The ice man also is studying refrigerators and selling his customers good ones. In this he is given vital help by the National Association of Ice Industries, which, early in the renascence of the ice industry, set up the Household Refrigeration Bureau in New York City with Dr. M. E. Pennington, a well-known refrigeration authority, as director. The association then entered into an arrangement with the laboratories of Columbia University to study the refrigerators of various manufacturers and report results to the ice men.

As one result of this close scientific study, there are numerous satisfactory ice refrigerators on the market today, ice boxes attractively and properly designed, sturdily built and well-insulated—some good ones as low as \$40.00 at retail. Many refrigerator manufacturers have cooperated closely with the ice association, making recommended improvements suggested by the study of their boxes.

Good ice refrigerators, when kept more than half full of ice, maintain average temperatures no higher than 45 degrees in the space directly under the ice compartment, and an average not higher than 50 degrees in the general food compartment. And in addition ice provides sufficient moisture to retain the freshness and flavor of foods.

THESE are the things that ice men have learned about their product and its receptacles and are busy passing them on to the public. There remains but one more important advantage of ice refrigerators and that is of particular interest to architects and builders.

That feature is the provision of facilities for outside icing. These facilities permit the ice man to deliver his ice without entering the house—he simply slips the cake of ice through the wall of the house or apartment into the ice chamber of the refrigerator.

(Continued to page 128)

BRIXMENT protects winter masonry . . .

BRIXMENT mortar, like any other mortar containing water, is not freeze-proof. Nevertheless it is used regularly for mid-winter masonry even in the severest northern climates. In fact during the winter months more BRIXMENT is sold in proportion to the volume of building construction than at any other time.

BRIXMENT mortar sets up faster than portland-cement-and-lime mortar in which a large quantity of lime is used and this set can be made to take place at any temperature before freezing occurs by heating the sand and water. Once BRIXMENT mortar has set, it remains sound and unimpaired no matter how long and severe the freezing period may be.

The oily content of BRIXMENT which reduces the freezing point of the mortar gives further protection in freezing weather. Send for architect's handbook. Louisville Cement Company, Incorporated, Louisville, Ky.

District Sales Offices: 1610 Builders Bldg., Chicago; 301 Rose Bldg., Cleveland; 602 Murphy Bldg., Detroit; 101 Park Ave., New York

BRIXMENT

for Mortar and Stucco

When a concrete mixer is used, the mortar can be heated by means of a torch attached to the mixer so that the flame is thrown inside the drum. If the weather is not too severe, this method alone will suffice.



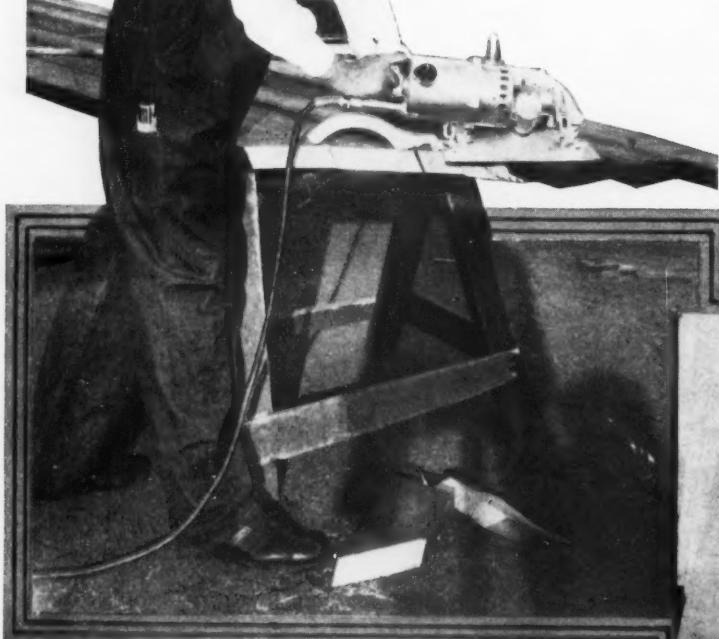
POWER SAWS ON THE JOB



Left: The Electric Hand Saw Trims a $\frac{1}{8}$ -Inch Rough Floor on a Large Apartment Job. Below: Stair Stringers are cut out in a fraction of the time required with an ordinary hand saw.



Below: With a Carborundum Disc, the Electric Hand Saw Is Efficient in Cutting Random Limestone Which Comes to the Job in Long Slabs.



Above: By Means of the Tilting Base, Set at a 45 Degree Angle, It Is Possible to Cut a Number of Hip Jack Rafters Requiring the Compound Miter Cut, Without Changing the Angle of the Base.



Refrigerator?

OK, it's a Frigidaire!

• • •

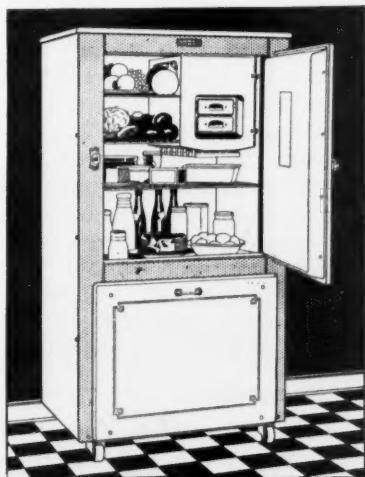
WHEN the prospective buyer checks the equipment in the new home, Frigidaire scores a strong point in winning his approval. For Frigidaire represents refrigerator value which is universally known and accepted.

Frigidaire is the *preferred* electric refrigerator. It offers beautiful, practical, easy-to-keep-clean cabinets. It gives surplus refrigerating power. It is equipped with the "Cold Control" which taps the extra power and speeds the freezing of ice cubes, salads and desserts. It has many

features that save time, work and trouble . . . features that have caused more Frigidaires to be bought than all other electric refrigerators combined.

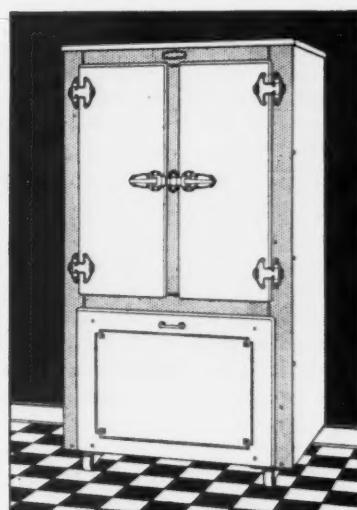
At the nearest Frigidaire showroom you can see the many Frigidaire models that meet all the requirements of homes and apartment houses. Call and examine them. Get the information especially prepared for architects and builders. Find out about the low prices and liberal terms. Or, if you prefer, write us . . . today.

FRIGIDAIRE CORPORATION, Subsidiary of General Motors Corporation, Dept. R-126, DAYTON, OHIO



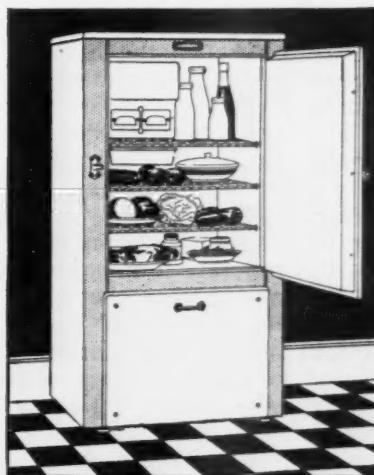
Model AP-7-1 Frigidaire

Self-contained cabinet; Tu-Tone Porcelain-on-steel exterior; seamless Porcelain-on-steel lining; approx. 7 cu. ft. of food space. Freezes 42 full-sized ice cubes.



Model AP-9 Frigidaire

Self-contained cabinet; Tu-Tone Porcelain-on-steel exterior; seamless Porcelain-on-steel lining; approx. 9 cu. ft. of food space. Freezes 54 full-sized ice cubes.



Model AP-4 Frigidaire

Self-contained cabinet; Tu-Tone Porcelain-on-steel exterior; seamless Porcelain-on-steel lining; approx. 4 cu. ft. of food space. Freezes 24 full-sized ice cubes.

FRIGIDAIRE
MORE THAN A MILLION IN USE

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Law for the Builder

Defects in Soil Are No Excuse for Failure of Contractor to Build House Properly

By LESLIE CHILDS

THE question of the right of a contractor to be excused for faulty construction, because of defects in the soil upon which a building is erected, is one with several angles. By the same token, since each case of this kind must necessarily be decided in the light of its facts, the subject cannot be covered by any hard and fast rule.

However, generally speaking, unless an owner assumes the risk of soil defects, a contractor will not be excused for faulty construction because of this fact, where he undertakes to complete work according to plans and specifications. In other words, a contractor will be bound to deliver according to contract, regardless of the soil difficulties he may have to overcome.

Contract Taken for Lump Sum

In White vs. Mitchell, 213 Pac. 10, a firm of building contractors signed a contract to construct a dwelling house for \$4,000. Before this contract was signed the contractors inspected the lot upon which the house was to be built, and appear to have had some doubt about whether the building could be properly drained.

At any rate, the contractors after examining the plans and specifications suggested that certain details be inserted so that water, if encountered in the basement, might be taken care of. The owners, however, refused to agree to this added expense on the ground that they believed the water "would take care of itself". The contractors thereupon signed the contract and undertook the work.

Sure enough, when the basement was put down large quantities of water made its appearance, and in addition the soil proved soft and mushy at that point. The contractors handled this situation as best they could, but despite their efforts about six inches of water stood in the basement while the building was being erected.

After the house was completed, there was a settling of the concrete foundation at one point which appears to have thrown the whole structure out of line. Naturally this caused a sagging of the floors in places as well as other serious defects. The owners refused to accept delivery of the house, and finally brought the instant action against the contractors for damages for breach of contract.

Upon the trial of the case, it was clearly in evidence that the whole difficulty had resulted from a failure of the contractors to handle the soft soil and water properly during the progress of the work. The contractors admitted as much, but took the position that the owners were at fault in not providing for drainage in the specifications. The contractors, in effect, said to the owners:

"We told you how this soil and water should be handled, but you refused to include proper specifications, so you are as much to blame as we are for the result."

The owners then came to bat with:

"You are experienced building contractors, are you not? You inspected the lot, and examined the plans and specifications and agreed to deliver us a

building in accordance therewith. The matter of soil and water risk was up to you, and we certainly won't pay you another red cent until the building is made according to contract."

Of the facts as they have been outlined the case finally reached the higher court on appeal. Here the principal question was whether or not the contractors were excused for the faulty construction, because of the appearance of the soft soil and water. In passing upon this question the court used the following language:

Contractors Not Excused

"It is contended * * * that the appellants (owners) are responsible for at least a part of the defects in that, when the specifications were drawn the respondents (contractors) made provision for certain expense for drainage, and that the appellants did not want to stand that expense because they believed 'the water would take care of itself.'

"This, however, cannot relieve the respondents (contractors). By their contract they impliedly agreed to build the house and turn it over in proper condition. It was their duty to examine into the condition of the soil and know the difficulties they might encounter. It was their duty to anticipate that water would be present in the basement to the damage of the house. These things they were bound to take into consideration because it was a part of their contract. * * *

"The general rule is that a builder must substantially perform his contract according to its terms and, in the absence of contract governing the matter, he will be excused only by acts of God, impossibility of performance, or acts of the other party to the contract preventing performance. If he wish to protect himself against the hazards of the soil, the weather, labor, or other uncertain contingencies, he must do so by his contract. The mere fact that the ground was soft would not excuse them from the performance of their contract. * * *"

In line with the foregoing, the higher court ordered the case back to the trial court to ascertain just what damages the owners were entitled to.

Summary

The foregoing case illustrates the general rule as applied by the great weight of authority in cases of this kind. This authority holding that unexpected difficulties in soil, water, or other elements, will not excuse a contractor from performance, unless such difficulties reach such a point as to be classified as acts of God.

By the same token, unless a contractor is willing to take the risk of elements of this kind causing difficulty in the work, he should not sign the contract. And by all means, a contractor should not sign a contract, where he has doubts about the difficulties to be encountered, in reliance upon what an owner thinks about it. For, as in the case reviewed, what the owner thinks will cut no ice if difficulty arises. The contract, as signed, will then be the thing, and it will be up to the contractor to deliver accordingly.

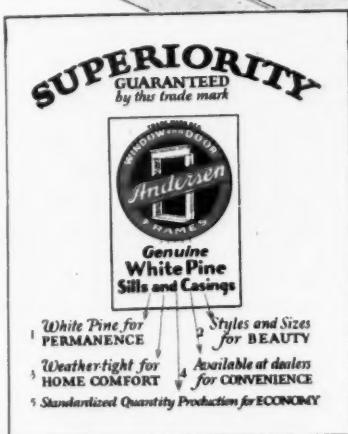
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\$2 for an Idea

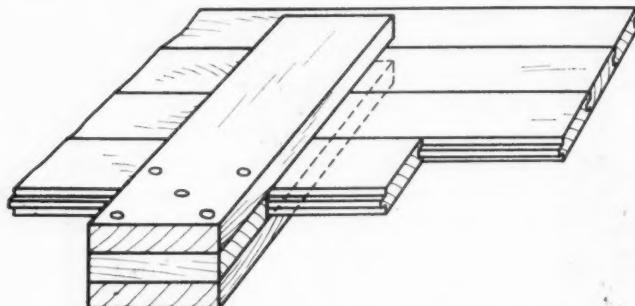
Dan is an ingenious cuss. Nothing ever stumps him. He always knows the way out when he runs into a tough problem out on the job or in the office. Dan is editor of this Department and will pay \$2.00 each for every good idea he can use here to show and tell other builders "how to do it." Send him a rough sketch and a short description of what the tough job was and how you handled it.

Address Dan-Do-It, care of American Builder, 105 W. Adams St., Chicago, Ill.

It Takes the Place of a Helper

IN putting on long ceiling I found it very difficult to handle the material without the aid of a helper until I hit upon the little device shown in the sketch, which I call a "silent partner." It is made of two pieces of scrap ceiling, about 14 inches long. Between these, at one end, I nail a small piece of $\frac{3}{4}$ -inch material. This leaves a jaw about 10 inches long.

I hook this jaw over one end of the ceiling and onto the ceiling already in place. Then, by working from the other



A Simple Means of Holding the End of Ceiling, While Nailing, Which Makes a Helper Unnecessary.

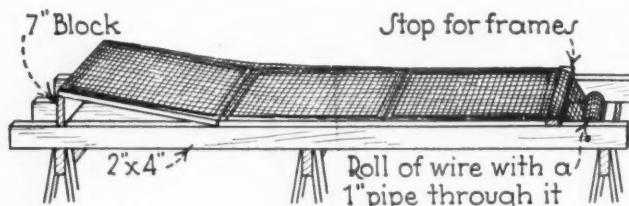
end, the long piece is held in place and does not sag as it otherwise would. This makes the work easy.

Another little time saver is lining the siding for gables before putting on the scaffold. I take a pencil gauge and line each board the width of the space. Then, when I am cutting and nailing the siding, all I have to do is to pull the boards to the line and nail them. It saves the time used for sighting or lining on the scaffold. The time it takes to line enough siding with the pencil gauge is small compared with the time it would take to work unlined siding.

CLARENCE E. EVANS, 1115 N. 24th St., Lincoln, Neb.

For Stretching Screen Wire

IN order to stretch screen wire tightly on screen frames I use the method illustrated in the sketch. Make a bench,



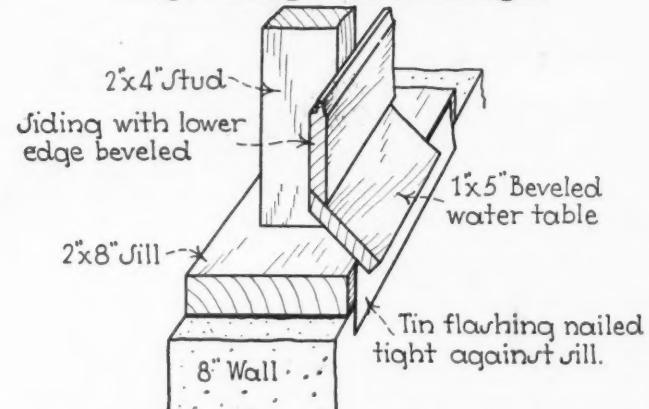
By Using This Method It Is an Easy Matter to Stretch the Screen Wire Tight on Two or Three Screens at a Time.

using two or three horses and long boards, long enough to lay two or three frames on it end to end. Eighteen feet is the length I usually use as this makes it possible to handle three screens at a time.

Place the screen frames on the bench, end to end. Tack the wire at one end of one of the end screens. Prop up the opposite end of the other end screen with a block seven inches high. Pull the slack out of the wire and tack it to the propped up end of the frame. Remove the prop and push the frame down onto the bench. This will pull the wire tight and it can be tacked in place on all the frames. The mouldings are then nailed in place and the job is finished.

FRANK WASHER, 376 Union Ave., Lynbrook, N. Y.
(Editor's Note: This method of stretching screen wire is merely a variation of a method previously described but is, perhaps, simpler and so deserves notice.)

Keeps Garage Walls Straight



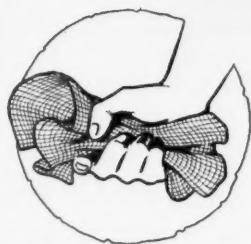
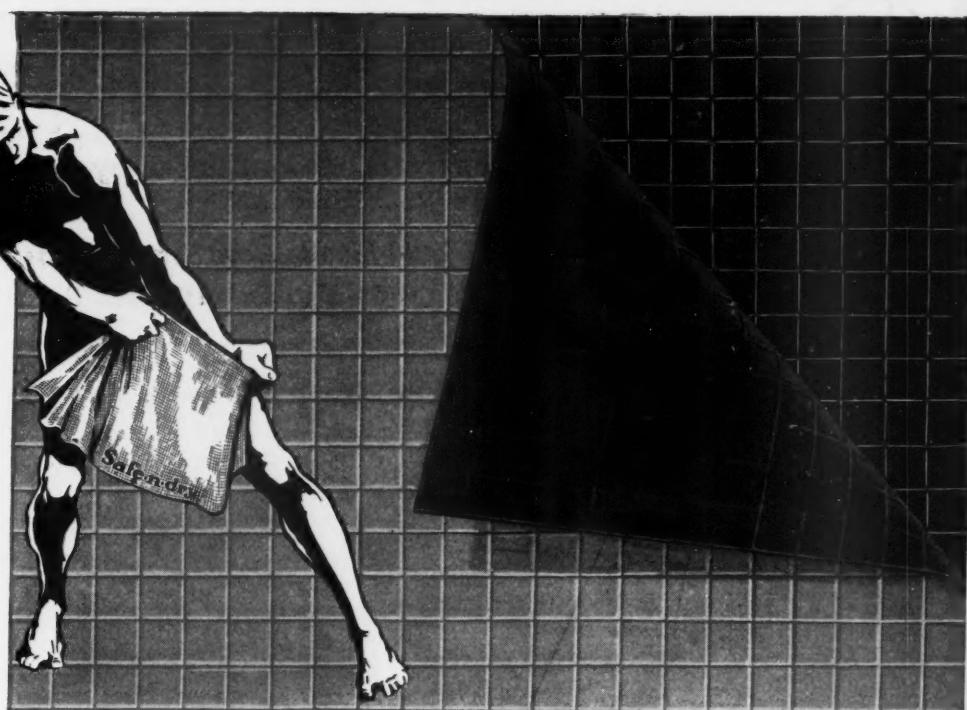
This Method of Building Garage Walls Keeps the Concrete Wall from Turning Out from the Weight on It.

SOMETIMES ago I discovered a good way to overcome the turning out of garage walls due to all the weight being on the outer edge of the wall, as it is usually built. It is customary to lay an eight-inch wall with a six-inch sill and then set two by four studs on the outer edge of the sill. Often, too, the garage is filled in with dirt or cinders considerably higher inside than the outside ground level and on top of all this swinging doors are used.

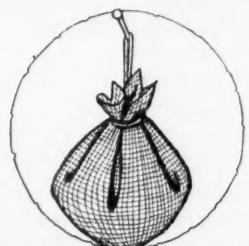
My practice is to lay an eight-inch wall with a two by eight sill on top of it, the outer edge of the sill even with the outer edge of the wall. I set two by four studs on this sill, centering them and nail a five-inch beveled watertable on before starting to put on the siding. A strip of flashing can be nailed on under the water table to cover the edge of the sill and close the crack between the sill and wall. The whole method is clearly shown in the accompanying sketch.

W.M. H. HARTZLER, Marshallville, Ohio.

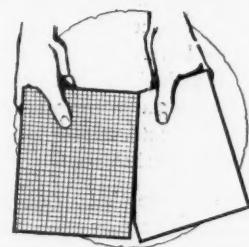
Just
try
to
tear
it
!



Abuse it—Crumple it—
Jump on it—Kick it
around



Make it into a bag and
fill with water



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Questions and Answers

This Department Conducted by
V. L. SHERMAN

Have You a Question You Would Like to Have Someone Answer?
Have You An Answer to Any of the Questions Listed Below?

QUESTIONS TO BE ANSWERED IN THE JANUARY ISSUE
Give Us Your Answer—Those Published Will Be Paid For.

1. I am building a basementless cottage and would like to have a good method for laying out the foundation walls and under-floor with concrete.

2. If possible can you show me how to rearrange the leader pipes from the furnace so as to combine them into trunks and still supply the same registers. I am given to understand that such a system saves on heat. How is that figured?

3. What are the "cooling cabinets" used by California people in their homes?

4. What are the "unit type of heaters" used in large garages, shops, and buildings of large size and height? Are they economi-

cal? Could they be applied to an ordinary house?

5. In building a garage under the same roof as the house what provision must I make against fire-hazard?

6. Just why should floors and trim be so smooth or sanded before finishing?

7. In cutting away the roots of a large oak tree while excavating for a foundation, how can I be sure I have not cut away too much, and can I seal them in any way so as to avoid killing the tree?

8. Are lightning rods much of a help in protecting a building?

SEE DECEMBER FOR ANSWERS TO OCTOBER QUESTIONS

Following are the questions asked in the September issue, and their answers

Question: What is the best method of removing or loosening old cement which sticks to the inside of a concrete mixer?

ANSWER: If the mixer is so constructed that there is no place for the concrete to hang up inside of the mixer, that is, no more than would be on a bright shovel, so that when through using the mixer a dash of water will clean it up, there will be no trouble. The best mixer I have seen was smooth inside with the paddles studded in with a round shank. The mixer should be treated carefully so as not to become dented or badly scored inside. It should not be allowed to rust. And it should not be allowed to lie with any mix left in it.

In removing the cement that has set from within the mixer by hammering or knocking, place a piece of wood against the outside of the barrel before striking it. Avoid denting the barrel. Chipping from within with a chisel will do the work but may cause damage if the steel is scored. I have heard of others who put in a couple of pails of water and kept the barrel turning over a fire in the hopes that steam generated between the barrel and the cement would loosen it, but I have never tried it.

M. S. BRANSTETTER,
Shreveport, La.

Question: What construction is used for the filled or rounded valleys seen in old English and French roofs?

ANSWER: The accompanying drawing, Fig. 1, shows what I believe is the simplest and most convenient way of framing a curved valley. This method is not an exact curve but is near enough for all practical purposes. The roof is framed and decked in the usual manner. Next, pieces of 2-inch material are cut to fit across the valley, A in the drawing.

These triangular pieces are spaced about 20 inches apart up the valley and are nailed to the decking. A piece of 1-inch by 6 inches, B in the drawing, is nailed lengthwise of the valley. A piece of 2-inch by 4-inch or 2-inch by 6-inch is then ripped diagonally and the square corners beveled to fit the decking. These are C in the drawing. When these are nailed in place the valley is ready for roofing.

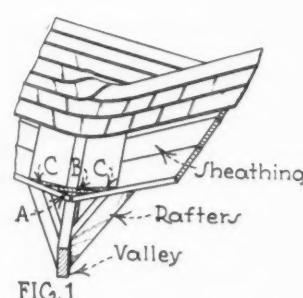
R. C. RANDLE,
Grayville, Ill.

ANSWER: Filled valleys can be made by framing and sheathing the valley in the ordinary way and then beveling a piece of 2-inch by 6-inch to fit the valley. This bevel will vary with the pitch of the roof. In laying composition roofing a dip in the weather line of the shingles will be made, and if the filling of the valley is too broad this change in the direction of the weather line will be noticeable. I am sending

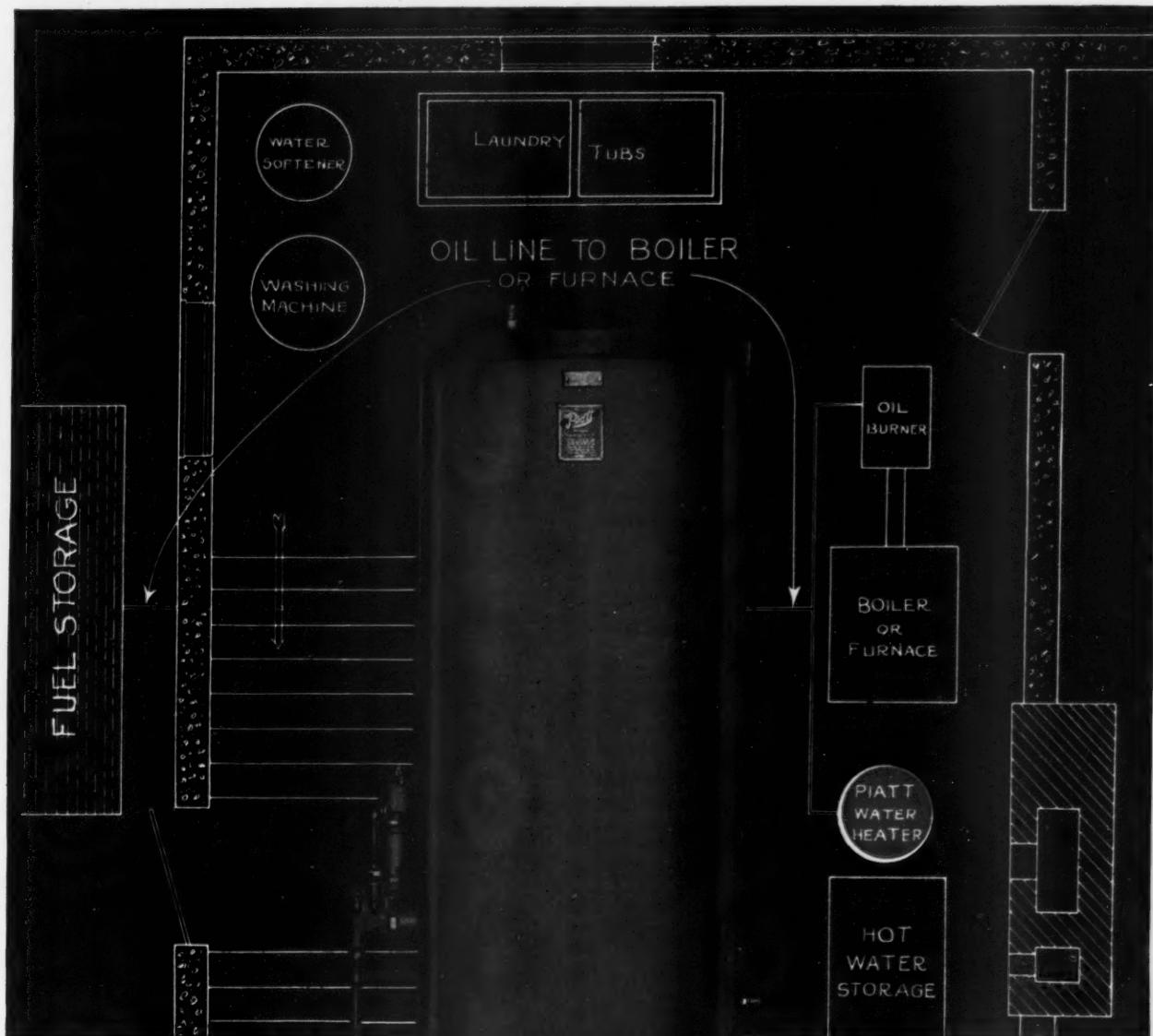
a sketch for the valley of a thatched roof which is much the same in appearance but not in construction. Fig. 2. This is a basket roof. (Page 126.)

Question: Can you give the correct span limits for floor joists in homes, 16 inches on center, for joists 2 by 4 inches up to 2 by 14 inches?

ANSWER: On page 118 is a table made up from a list to be found in Kidder's Architects' Handbook. This table goes into a little more detail than just for homes, where a floor



Construction for Filled Valleys with Composition Shingles.



A new series of economical Piatt Oil-burning Water Heaters is now ready to help you sell homes. The old problem of domestic hot water supply is solved again by Piatt, and even more simply than before. The Piatt Series 'B' Heater has mechanical improvements that make the entire heater more compact; give it more capacity; and enable it to supply more hot water per unit of fuel. Piatt Oil-burning Water Heaters are more attractive, more convenient, more economical than ever before; that means they are, more than ever, able to help sell houses.

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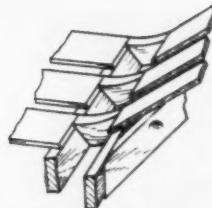


FIG. 2

Construction for Thatched Roof Valley Basket Type.

load of 60 pounds to the square foot is allowed. It will be noted that 2-inch by 4-inch is not included. They are not deep enough for any reliability in loading except as sleepers.

Question: How can I design a fireplace of any reasonable size and be certain that it will draw well?

ANSWER: Without considering any definite size these qualities in a fireplace make for a clear draft. The depth should be about half the width of the opening, but not less than 15 inches. The height of the opening should be not greater than the width. The hearth may be level with the floor or above. The back of the fireplace should be less than opening in width and from a point half-way up from the hearth to the throat the back should be brought forward so that the opening into the chimney or throat is well to the front. This throat should extend the full width of the opening and be not less than one-tenth the area of the opening of the fireplace in cross-sectional area. If possible a damper should be built into the throat, hinged at the back, and adjustable by means of a screw operated from the front. This gives a graduated draft.

The damper also provides an extension of the smoke shelf which should extend back from the throat and be curved backward and upward into the flue. This shelf diverts cold down-drafts, deflects rain, and allows the warm air from a starting or slow fire to rise. The flue of the chimney should not be less in area than the throat, should be straight, lined with flue tile, and closed all of the way to the top. The top of the chimney should rise 4 feet above any flat roof and 2 feet above the highest point of any ridged roof. Wherever trees, adjacent houses or structures are likely to cause air eddies a flag across the top of the chimney with openings on parallel sides will help. A revolving top will also help.

Question: Is there any way in which telephone and light wires can be run underground to a house?

ANSWER: This has been done and is of great advantage in planning a yard. But it should not be done except under the direction of the power company and the telephone company. The lines are brought down to a trench if the power lines are pole-strung. This trench must be located by them, and lined under their direction. The entrance from the trench into the house is also a matter for them to settle. Any utility company and any telephone company will be able to undertake it within their territory, and from what experience I have had I should say they will be glad to do it.

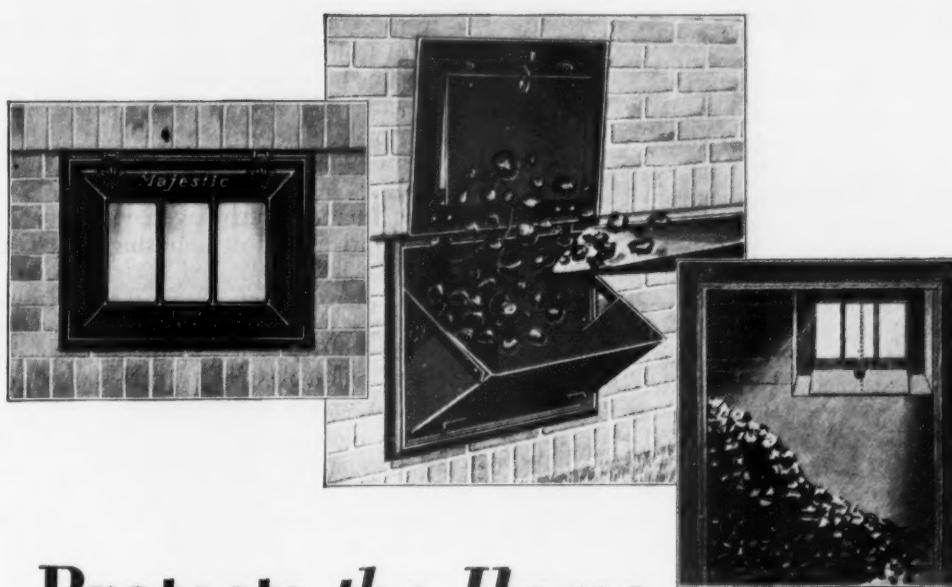
MAXIMUM SPAN FOR FLOOR JOISTS 16 INCHES ON CENTRES					
SIZE OF JOISTS	HEMLOCK	WHITE PINE	SPRUCE OR NORWAY PINE	OREGON OR TEXAS PINE	GEORGIA PINE
(1) 60 LBS. PER SQ. FT.					
2x6	8'-9"	8'-10"	9'-6"	9'-10"	10'-6"
2x8	11'-9"	11'-10"	12'-8"	13'-1"	14'-1"
2x10	14'-9"	14'-10"	15'-9"	16'-4"	17'-7"
66 LBS. PER SQ. FT.					
2x12	17'-2"	17'-3"	18'-4"	19'-0"	20'-6"
2x14	20'-0"	20'-1"	21'-6"	22'-2"	23'-10"
(2) 93 LBS. PER SQ. FT.					
2x10		12'-9"	13'-8"	14'-1"	15'-2"
2x12		15'-4"	16'-5"	17'-0"	18'-3"
96 LBS. PER SQ. FT.					
2x14		17'-9"	19'-0"	19'-7"	21'-2"
(3) 102 LBS. PER SQ. FT.					
2x10		12'-4"	13'-3"	13'-8"	14'-9"
2x12		14'-10"	15'-11"	16'-5"	17'-8"
105 LBS. PER SQ. FT.					
2x14		17'-3"	18'-5"	19'-0"	20'-6"
(4) 123 LBS. PER SQ. FT.					
2x10		11'-7"	12'-6"	12'-10"	13'-10"
2x12		14'-0"	15'-0"	15'-5"	16'-7"
126 LBS. PER SQ. FT.					
2x14		16'-2"	17'-4"	17'-11"	19'-3"
(5) 174 LBS. PER SQ. FT.					
2x10		10'-2"	10'-11"	12'-5"	13'-1"
2x12		12'-2"	13'-1"	14'-11"	15'-8"
177 LBS. PER SQ. FT.					
2x14		14'-2"	15'-2"	17'-3"	18'-2"
① DWELLINGS AND SCHOOL ROOMS WITH FIXED SEATS					
② OFFICE BUILDINGS					
③ CHURCHES AND THEATRES WITH FIXED SEATS					
④ ASSEMBLY HALLS AND CORRIDORS					
⑤ RETAIL STORES					

Question: My home has five rooms with eight lighting fixtures and eight outlets. I am told that in adding two rooms with three fixtures and three outlets I will have to change the wiring. What about it?

ANSWER: In recent years there have come increased restrictions with regard to house-wiring. Some blame the unions, some the manufacturers, some the contractors. The party largely to blame, if we could really call it a fault, is ourselves and wives. We have toasters, waffle-iron, irons, radiant heaters, electric grates, bath heaters, electric stoves, and possibly some other household items which we will not readily give up. Any of these heating elements consumes at a 500-watt rate, or more, and can generally be put into operation through a wall plug. The average lamp runs 40 or 60 watts. As houses have been wired up to the last few years there is a limit of about 1,000 watts to a single circuit, in many cases 660 watts. Above this capacity there is chance of overloading and causing trouble. Adding to this the fact that all the connections in the circuits, that is wiring at the plugs, warped sockets, and what-not, increase the resistance in the circuit and throw more load on it, we see that some limit must be placed on the circuit load. Your house is probably wired for the existing sockets or plugs or outlets, with a maximum placed according to the code under which it was wired. Whatever you add should be arranged for on a separate basis, probably a separate circuit, possibly two. This will depend on the probable use of the outlets. If you should include the new wiring in the existing circuit or circuits you may overload it. This will cause trouble sooner or later. Under no circumstances should the wires or connections be allowed outside a metal covering.

Question: The wall next a soil stack is discolored, at times very noticeably. What is the cause of it and what can I do about it?

ANSWER: There is a current of cool air down the sides of a soil stack. During the summer a good deal of moisture is deposited on the stack and the air about the stack is very moist. Some of this moisture is absorbed by the wall causing the discoloration. Some of the trouble may be eliminated by closing the opening around the stack in the attic floor and the basement ceiling. This will help. A better plan might be to cover the stack, where the discoloration is serious, with regular pipe covering.



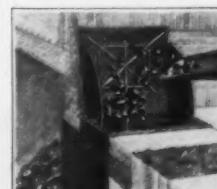
Protects the Home Lights the Coal Bin Insured against Breakage

EVEN the coal window can be featured in your sales talk . . . if it's the right coal window. Take this Glass Panel Majestic, for instance: Attractive design . . . harmonizes with other basement windows. Protects the home when coal is delivered. Breakproof . . . the Certified Malleable Iron and Keystone Copper Steel Construction sees to that. Plenty of light for the coal bin—a feature that will appeal to every man who ever pushed a shovel into a dimly-lit bin. Heavy plate glass panels firmly set in rubber, and protected by a steel shield when coal is thrown in. Positive, automatic latch. And—what is mighty important to you—the Majestic is backed by twenty years of national advertising. When you mention the Majestic, your words mean more. Write for catalog, which describes this and seventeen other popular styles, made in a range of prices that will let you fit a Majestic into any home you're building.

• [Majestic Quality REALLY Costs Less] •

THE MAJESTIC COMPANY, 629 Erie Street, HUNTINGTON, IND.

**OTHER
MAJESTIC
QUALITY PRODUCTS
that help sell homes**



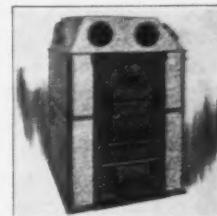
Low foundations have popularized this grade line Majestic coal chute.



Every modern home should have this convenient milk and package receiver.



The sanitary and sightly way to dispose of garbage . . . in the Majestic underground garbage receiver.



The heart of a really efficient heating system—the Master Majestic Down Draft Furnace.

Write for full information about any one or all of these Majestic Quality Products that help sell homes

MAJESTIC COAL WINDOWS AND BUILDING SPECIALTIES



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Questions and Answers

(Continued from page 126)

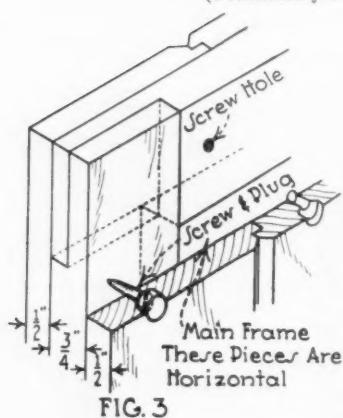


FIG. 3

Construction of a Batten Door for the Living Room to Outside.

holes plugged. Such doors still stand up very well, are little affected by moisture or heat, and if well made with good lights and the right kind of hardware make a handsome appearance.



What of the Refrigerator?

(Continued from page 116)

As all architects and builders know, outside-icing refrigerators are fitted with special doors which open outside of the house. Their installation is inexpensive and may be provided for easily in the plans of either new buildings or remodeling jobs. Virtually every refrigerator manufacturer makes outside-icing refrigerators and their catalogs contain blueprints and full information.

Outside icers provide maximum convenience for householders at minimum expense. With them there is no worry at all. The ice is delivered and it goes to work at once—automatically, silently, efficiently and inexpensively.

Conscientious architects and builders, putting service to intelligent clients above all else, will consider most seriously the installation of good ice boxes with outside-icing equipment.



Homes for \$1.00 per Day

(Continued from page 74)

which is the equivalent of a third mortgage.

It is this easy financing plan for the home buyer that makes the market for the operative builder. It is only a question of production for the demand. There will be producers, if there are potential buyers. As the market is slow in the higher priced ranges, sales are less frequent, the builder adjusts his construction to a lower range, and provides accordingly. This competition between builders brings a lower cost house. The crux of the situation is the movement of houses, which movement the easy plan of the Building and Loan Association facilitates.

Philadelphia has more such associations than any other city in the country. As a natural consequence of this situation is the mass production of dwellings, each unit of which may be sold, under a separate agreement, the buyer being given title to his holdings without cooperative responsibility for upkeep, taxes and like costs attendant upon ownership in cooperative

apartments. In mass production there are saving possibilities which tend to lower the sales price of dwellings. Dwelling production becomes a manufacturing proposition. Many Philadelphia builders have perfected their operations under such plan so as to effect savings in the purchase or production of materials and in financing construction costs.

There are other factors which have contributed to the relative low sales price of local housing as compared with the two other large cities of Chicago and New York. We have here an excellent transit situation, largely created by the fan-like spread of our commuting steam and electric railroads, which in the past opened up, in connection with through traffic service, commuting stations in virgin territory.

But perhaps the most influential factor in the distribution of the population of the city has been the municipal regulation of lot sizes. Establishing as a standard the minimum frontage of 14 feet per lot, it has created the small lot as the prevailing practice, only recently deviated from in response to demands for a new style of housing, characterized as the "daylight" house, two rooms deep and 16 feet to 18 feet in width. By thus encouraging the small lot, lot values are kept within the standard ratio dwelling cost of land value to construction cost as one to five.

Manifestly, if the standard lot were of the 25-foot or 50-foot frontage established by practice or law in many cities, the building value therein would be commensurately higher, and the structure erected thereon, house more than one family. By permitting the 14-foot frontage, the owner's land investment per building is lower and the cost of the building erected is likewise lower. Whether this is necessary or not, it has been a large factor in building up Philadelphia as a city of small homes. The continuance of such subdivision is stimulating the continuance of the practice of spreading the population. The inroad of the tenement type in the past five years has been partly due to the increase in land values in consequence of a shortsighted transit development program, which furnished fast transit for a small area without feeder lines beyond, and which does not keep pace therefore with population needs. But this, as previously stated, is creating its own agitation for correction.

Philadelphia housing in the lower priced ranges is largely of the row type. There are those who object to this, who point out the monotony of the skyline and facetiously ask how a Philadelphian recognizes his own doorstep. Artistic expression is a glorious ideal, but art is costly. If to get art we must add costs to the construction of dwellings that force up sales prices beyond the reach of the average wage earner, we are not contributing to the solution of the problem confronting every city and town in the land. We are forcing even the average earner to utilize the cast off housing of the more affluent among our population. It is not art, however, that is found in the tenement cities; it is only a higher skyline and five flights of stairs to reach it. The low built house, with its two rooms deep, its wide space of street and set back between opposite facades and its equally wide areas between the rear walls of opposite buildings, means light and air, privacy and home ownership, with the sense of the owner's castle for the family that occupies it. This is the type that lends itself to mass production and to lower rental and purchase rates and gives the promise of sanitary equipment and hygienic occupancy. Until this goal is attained for all our population, we can bear with good grace its manifest shortcomings from our aesthetic ideal.

SKILSAW

the original electric hand-saw



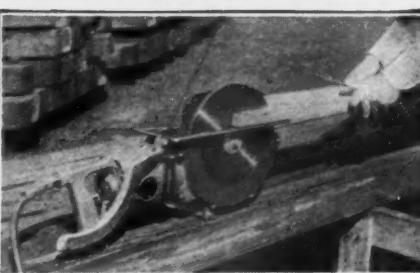
Cut a stair stringer of 16 steps out of 2" lumber complete in twelve minutes with Skilsaw. It saves as much time on other operations too.



Trim a door fast, accurately and so neatly you won't need to put a plane to any edge. Skilsaw with a mitre blade will do it.



Turn SKILSAW upside down on a bench and you've got one of the fastest cutting and most powerful table saws you'll ever need.



Gang the work for Skilsaw and you'll make concrete forms in half the time because Skilsaw goes to the work, anywhere—you don't have to carry the lumber to Skilsaw.



In tight places where hand-sawing is inconvenient and slow let Skilsaw do the work. It then becomes a fast easy job.



the SKILSAW way makes sawing pay

SKILSAW, INC., Dept. 2
3310 Elston Avenue, Chicago, Illinois

Yes, I'll watch a five minute demonstration of Skilsaw. This doesn't obligate me at all.

Name

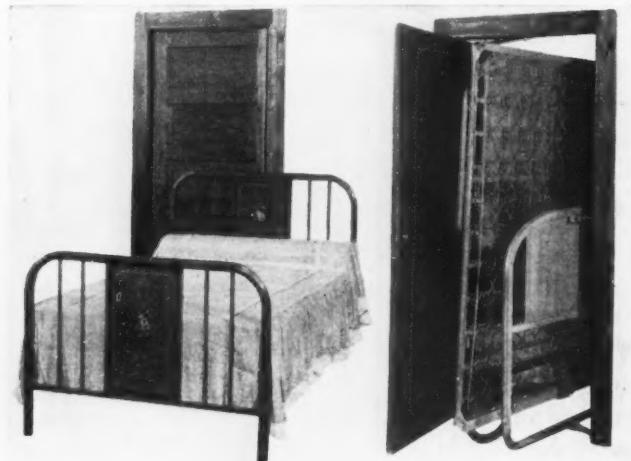
Address

What's New in Equipment for Buildings

For further information in regard to any item described in the "What's New" Departments address, American Builder Information Exchange, 105 W. Adams St., Chicago

Improved Type Disappearing Bed

A COMPANY long experienced in the manufacture of high grade beds has recently brought out a disappearing bed which it describes as "not just another bed that comes out of a closet, but a bed and door that make the closet disappear." This means that, when the bed is swung out into the room for use, the closet door can be closed. This is accomplished by means of special door closing hardware.



This New Disappearing Bed Can Be Lowered for Use and the Closet Door Closed.

This bed operates on a standard size door, two feet ten inches by six feet eight inches, so no special designing of the closet is necessary. Rather is this bed designed to fit the average size closet. The bed itself has no hinged legs. Both the head and foot are rigid, just as on a stationary bed. When let down it rests firmly on the floor and is independent of the closet door.

The bed is furnished in a wide variety of new and popular models of head and foot ends and in finishes to match the furnishing or woodwork. The finish, including the last coat of varnish, is baked on at high temperature and will last almost indefinitely. A cigar or cigarette may be allowed to burn out on it without injury.

A 99-coil bedspring is used and stiffness is assured by 1½-inch pipe sides, which also prevent twisting from the constant raising and lowering of the bed. A spring tension is adjusted to the weight of the bed and mattress, making the bed easy to operate.



Automatic Heat Control

AUTOMATIC control of heating plants, lighting, and other equipment is rapidly moving toward universal acceptance. The automatic control device shown here is one of a new line carrying certain distinctive features. One of the outstanding features of this control is that it makes it possible to obtain a day temperature level of say 70 degrees and a lower night temperature level of say 60 degrees, without the aid of a hand-wound clock.

These controls are designed to fit any type of heating plant

burning coal, coke, gas or oil. They operate unit heaters, blowers, lever valves, solenoid valves, or electric diaphragm valves.

Besides handling the automatic control of opening and closing drafts, levers or valves of the furnace, the same unit, with the addition of a small, built-in, auxiliary attachment, will safely turn "on" and "off" electric heaters for cold rooms, automobile manifold heaters, rising bells, store window lights, electric fans, radio for time signals or setting-up exercises, etc.

The automatic heat control is simple to install. It consists of a thermostat located in a suitable room, a motor and clock unit mounted on a panel near the heater and connected electrically with the room thermostat and mechanically with the heater's draft and check damper, and a safety device on the heater itself.



An Automatic Control Which Offers Different Day and Night Temperatures Without Hand Winding.

For Modern Sanitary Homes

EVERY home, even though it may be located in a suburban or rural district, beyond the range of sewerage systems, can be made modern, comfortable and sanitary by installing a modern chemical toilet system. Such an outfit is easily installed in a few hours' work. All that is necessary is a hole in the floor for the bowl and piping for ventilation, which may be into a convenient chimney or through the roof. All ventilation must be above the highest point of the roof.

These outfits are equally suitable for private homes, schools, summer and tourist camps, or in fact anywhere that a modern system is desired. A home outfit which accommodates five persons need be drained only once every six months.

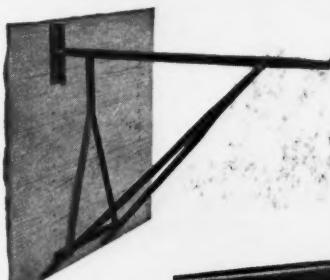
All these systems are provided with complete standard equipment, unless special conditions are to be met, in which case special piping is provided. The standard equipment includes one vitreous china bowl with mahogany finish birch seat, one 142-gallon tank with four-inch drain valve, agitator, toilet paper holder and an initial charge of chemical. Another standard outfit is the same in every respect except that in place of the china bowl a specially constructed steel hopper with mahogany finish birch seat is provided.



A System Which Is Simple to Install and Affords Modern Convenience in Any Home.

GABRIEL

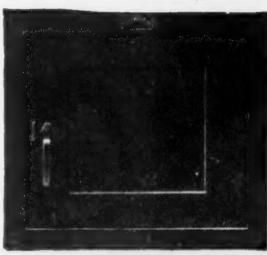
ROLLED STEEL PRODUCTS



Double-leg folding bracket with stucco attachment.



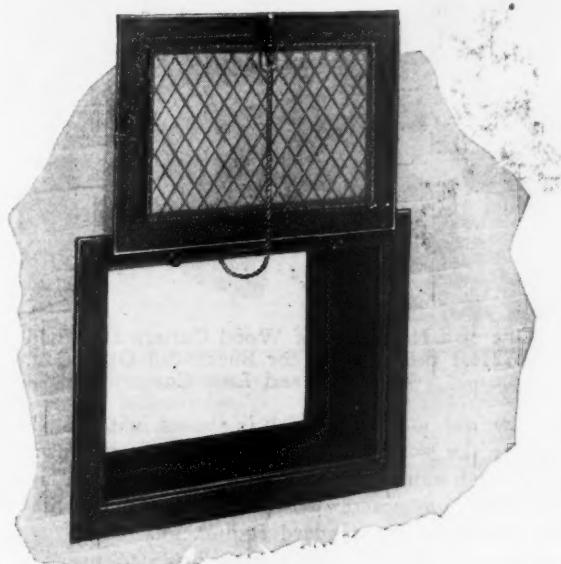
Gabriel Dome Damper with vertical flange and handle control.



The Gabriel Package Receiver. An asset to any home or apartment.



Gabriel Garbage Receiver



Gabriel Rolled Steel Coal Chute

CAN BE RELIED UPON FOR EVERLASTING SERVICE

Each of these products illustrated here is designed to give the maximum of service as well as adding to the attractiveness, comfort and salability of the building. Note their advantages listed below.

GABRIEL ADVANTAGES

Heavy copper bearing rolled steel throughout.

Electrically welded joints.

All hardware and operating parts parkerized to prevent rust.

Positive anchorage.

Unbreakable rolled steel hinges.

No lintels necessary—specially reinforced boot carries inside masonry.

Automatic spring latch—positive closing and burglar proof.

Automatic door opening.

Removable hopper—easily attached.

Designed to harmonize with important home details.

SEE THESE PRODUCTS AT YOUR DEALERS

An inspection will convince you of their advantages. Gabriel products are a sales asset on your new homes, and insure satisfied customers.

Mail coupon if you prefer.

GABRIEL STEEL COMPANY

13700 Sherwood Ave., Detroit, Mich.

Please send me full information about products listed below

- Gabriel Coal Chutes
- Gabriel Package Receivers
- Gabriel Garbage Receivers
- Gabriel Steel Joists
- Gabriel Dome Dampers
- Gabriel Scaffold Brackets

GABRIEL STEEL COMPANY

13700 Sherwood Ave.

DETROIT, MICH.

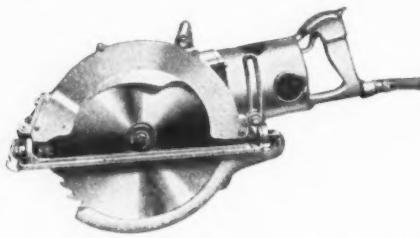
What's New in Contractors' Equipment

For further information in regard to any item described in the "What's New" Departments address, American Builder Information Exchange, 105 W. Adams St., Chicago

Electric Saw for Heavy Work

THE increasing popularity of its portable electric hand-saws has induced the manufacturer of one of the most popular lines to produce a model for use on heavy construction work. Like the smaller models, this new saw has an aluminum body, shafts and gears of chrome nickel steel and is powered with a universal motor which operates from any light socket on either alternating or direct current. The 12-inch blade has a maximum cutting depth of $4\frac{1}{8}$ inches. The base of the saw is instantly adjustable to the depth of cut desired.

One model is provided with an improved swivel foot for beveling with a degree gauge and is fitted with an approved safety guard which protects the operator regardless of the position of the saw or the type of cut being made. It is an exceptionally fast and powerful saw for its size and weight, averaging one inch of cutting capacity to eight pounds of weight.



Electric Hand Saw for Heavy Construction Work Now Available to the Builder.

The other model can be changed into a bench or table saw by simply turning it up side down, no further adjustment being necessary. Besides cutting and ripping heavy lumber ten times as fast as it can be done by hand, the new saw cuts metal up to 20 gauge, copper cable, lead pipe and, when fitted with a carborundum disc, will also cut marble, limestone, brick, slate, terra cotta and similar materials of stone and composition.

Standard equipment includes one combination rip and cutoff saw blade, and adjustable rip fence attachment, rubber covered cord with turn and lock attachment plug, a high pressure grease gun filled with lubricants and a socket wrench—all contained in a handy carrying case with the saw itself.



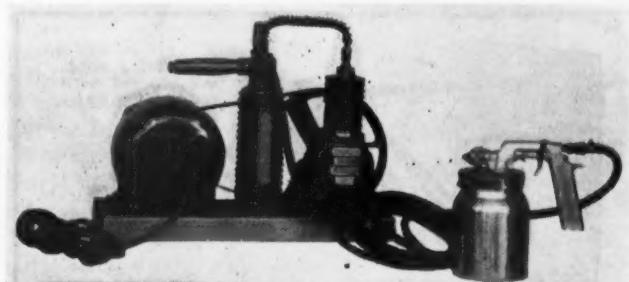
An All-Purpose Paint Spray

THE completion of an all-purpose, utility spray painting and finishing outfit has recently been announced. This outfit is being manufactured on a large production basis for general utility work such as touching up, refinishing, repainting and lacquering practically anything. It is also adapted to the spraying of insecticides and disinfectants.

This is a complete unit equipped with a full quart size metal container and a new pressure cup spray gun supplying an atomized flat spray four inches in width. The air compressor unit is belt driven and connected to a $\frac{1}{4}$ H. P. electric motor of well known make. The unit has a capacity of 2.16 cubic feet of air per minute.

The outfit is sturdily constructed. A rib cast iron air

container is mounted between the motor and the compressor on a pressed metal base all of which is mounted on rubber feet. The cylinder and base are cast in block, of seasoned gray iron and are accurately machined.



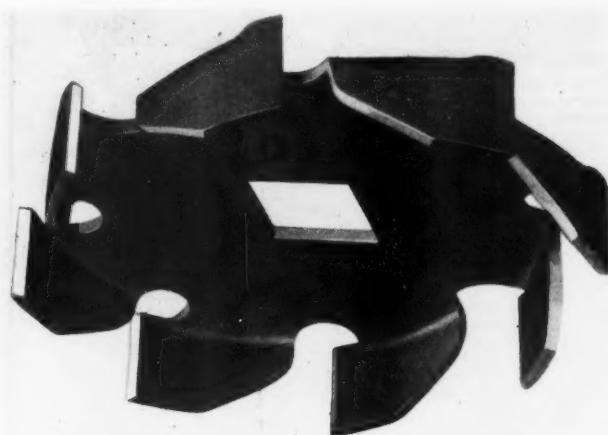
This General Utility Paint Spray Is Being Turned Out on a Large Production Basis.

Ten feet of rubber covered electric cord, attachment plug and 10 feet of durable, braided rubber air hose are attached to the outfit. It comes completely ready for use.



A New Line of Wood Cutters

MODERN trends in wood working tools are directed towards successful operation, sturdiness and low cost. Such features have been embodied in the new circular saw illustrated here. Lightness is another factor of this wood cutter which has a wide variety of uses and which may be used on either portable electric or stationary equipment.



One of a New Line of Wood Cutters Designed to Meet the Demand for Successful Operation, Sturdiness and Low Cost.

The saw, one model of which is shown in the illustration, is made by the stamping process and can be produced in all diameters and widths required for practical use. Adaptations can be made for practically every purpose and the cutter can be placed on all standard equipment.

Extensive experiments have been made to prove beyond doubt its successful operation and 500 tools placed in use among carpenters have proved highly satisfactory.

ONLY ONE MOVING PART



Before the Reid-Way came on the market, it was thought necessary to drive sanding drums through belts, chains or gears. This meant added weight and loss of power. The Reid-Way revolving field motor brought a new conception of a light weight sanding machine. The sanding drum itself is the motor and this high-speed, high-efficiency, sander with remarkably long life has won nation-wide recognition.



The new Reid-Way Whirlwind model brings added power with no increase in weight. It is safe, fast, accurate, dustless. Ball bearing guide rollers insure positive control of cutting. It plugs in any light socket where 110-220 Volt AC is available. A circular describing this remarkable machine and its many uses will be sent on request.

*Sales Agents and Distributors:
Experienced representatives
are invited to write for open
territory.*

THE REID-WAY COMPANY

746 North 16th Street - CEDAR RAPIDS, IOWA

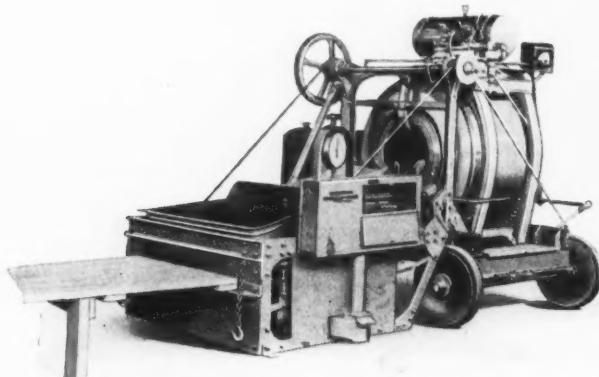
The Reid-Way Company,
746 North 16th Street,
Cedar Rapids, Iowa.

Gentlemen: Please send free circular describing the new Reid-Way Whirlwind Sander.

Name _____
Address _____

Mixer Offers Accurate Measure

DESIGNED for the jobs requiring concrete of pre-determined strength, the new mixer shown here accurately proportions aggregates by weight and water by volume. It meets every requirement of accuracy in proportioning and speed in operation together with extreme portability. Today uniform concrete of dominant strength is demanded on the smaller jobs such as culverts, bridges, highway maintenance jobs and the smaller buildings, to the same degree it is required on the larger concrete projects. The new mixer meets this demand.



Accuracy of Proportioning and Speed of Operation Are Featured in This New Model Concrete Mixer.

Each material, cement, sand and stone is weighed separately on the three beam scale. The water is measured by an accurate volume water measuring tank. The desired weight of stone is set on the stone beam and the weight of sand and cement on their beam, all materials being weighed in the skip. An indicator dial registers when the material being measured is nearing the desired weight on the beam. The skip is cleaned automatically by a vibrator as the materials are being shot into the drum during charging. With this device the charging action is speeded up and a clean skip is provided for each batch.

When moving this mixer from job to job, a two-wheeled rubber-tired trailer is attached to the mixer for carrying the scale and cradle. It is only a matter of minutes after arriving on the job to detach the trailer, lower the scale and cradle to the ground, and level properly. The machine is then ready for mixing. The mixer operator controls charging as well as mixing and discharging, all operations being centralized in his control.



High Speed Hole Saw

THIS new, high speed, steel hole saw is made in sizes for cutting holes from $\frac{3}{4}$ of an inch to $3\frac{1}{2}$ inches in diameter, for use with electric drills for fast cutting in metal and wood. The blades in these saws are made of high speed steel, designed to be easily and quickly replaced in the holder. Only one mandrel is necessary for all sizes of saws. These saws are especially adapted to automotive, plumbing and electrical work.



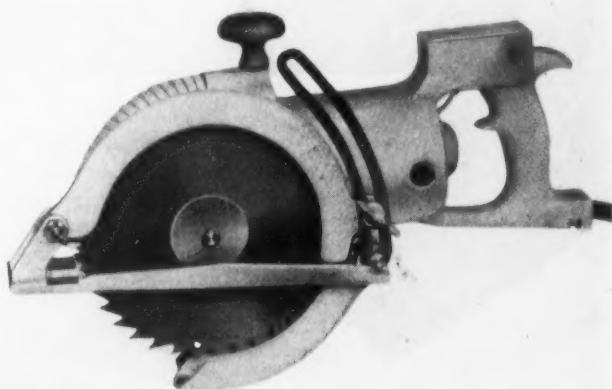
A New Electric Hand Saw

THERE has recently been placed on the market a light weight, one-hand electric saw for cutting any board up to $2\frac{5}{8}$ inches. It weighs only 15 pounds. Its compact con-



A Hole Saw for Cutting in Either Metal or Wood.

struction is featured by a sawdust blower for perfect vision, convenient trigger switch, momentary contact, rip gauge to save marking board to be sawed, and depth gauge easily adjusted by one wing nut.



This New Electric Hand Saw Is Intended for Use on a Wide Variety of Wood in the Building Field.

This unit is built complete, ready to use. Accessories include 15 feet of extension cord, one-pound can of lubricant, grease gun, steel carrying case, adjustable depth gauge and rip gauge.

The saw is designed to meet the needs of carpenters, engineers and contractors on a wide variety of work and also to be used for crating in industrial shipping departments, and plant maintenance and repair work of all kinds.

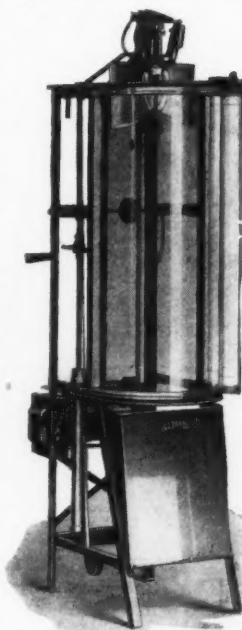


Small Blue Printing Machine

THIS blue printing machine is particularly designed for use in drafting rooms where only a small quantity of blue prints is required or where emergency prints are wanted in a hurry. It is also suitable for use in vocational schools. It is well constructed with a framework so rigid that the machine is shipped already set up. It occupies but a small floor space.

The machine consists of a half cylinder of glass supported in a metal frame which is finished in olive green enamel. The tracing and blue print paper are held in contact with the glass by a curtain mounted on a spring roller. With a clear tracing and this company's blue print paper an excellent 24 by 36 inch blue print can be made in one minute with one drop of the lamp, using a 220 volt direct or alternating current lamp, it is stated. With a 110 volt lamp only $1\frac{1}{2}$ minutes are required.

A special sheet washer has been designed for use with this machine. It is of the same general construction as the large sheet washer made by this company. It dispenses with the use of an open bath tray, dripping prints and wet floors. When it is used the prints are washed better and dried more quickly than when soaked in a tray.

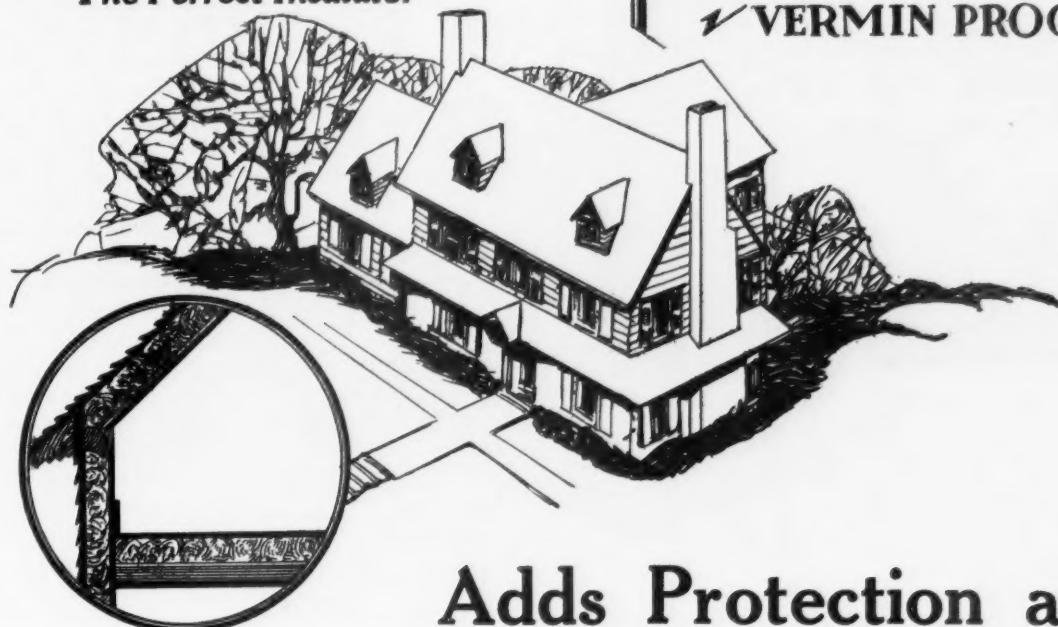


For Small Drafting Rooms This Blue Print Machine Will Be Found Highly Efficient.

MINERAL WOOL

The Perfect Insulator

- ✓ COLD PROOF
- ✓ HEAT PROOF
- ✓ FIRE PROOF
- ✓ SOUND PROOF
- ✓ VERMIN PROOF



Adds Protection and Comfort to Your Home

MINERAL WOOL, placed in the walls, floors and rafters of a building, is an unfailing shield against the elements.

It keeps the heat where it belongs—inside in Winter and outside in Summer.

The saving it effects in Winter fuel will alone quickly pay for installation.

It is a decided economy, not an additional building expense and the comfort it adds is immeasurable.

Mineral wool is a sanitary, indestructible, entirely mineral, sound deadening material, easy to apply and low in cost.

Free sample and illustrated booklet will be forwarded upon request.

U. S. MINERAL WOOL CO.
280 Madison Avenue, New York, N. Y.
Without obligation you may send free sample and illustrated booklet to

Dept. B

Name.....
Street.....
City..... State.....

U. S. Mineral Wool Co.
280 Madison Avenue
New York

Western Connection—Columbia Mineral Wool Co.
South Milwaukee, Wisconsin

Cabot's Quilt



This house is in Sleepy Hollow Manor, a new development at North Tarrytown, New York. Architects, Farrar & Watmough; Builders, Henry Mandell Associates. Walls and roof insulated with Cabot's Quilt.

Built-In Comfort

This is one of the many houses in Sleepy Hollow Manor where lasting comfort has been built in. The walls and roof are insulated with rot-proof, fire-resistant Cabot's Quilt for warmth in winter and coolness in summer.

Be sure to build Cabot's Quilt into your next house. It will pay for itself in first costs by reducing the size of the heating plant and it will assure comfort for your customers.

Send for our free Quilt book today, using the coupon below.

Cabot's Quilt

Quilt

OUR COUPON ON THIS LINE

Samuel Cabot
Incorporated

141 Milk Street, Boston, Mass. AB-11-29
Offices also at NEW YORK, CHICAGO, PHILADELPHIA,
KANSAS CITY, LOS ANGELES, SAN FRANCISCO,
MINNEAPOLIS, PORTLAND, AND SEATTLE

Gentlemen: Please send me your QUILT BOOK.
(Write your name and address in the margin below.)

NEWS OF THE FIELD

Convention and Show Dates

- Nov. 1-15, 1929.....Philadelphia Chapter of the American Institute of Architects, and the T-Square Club of Philadelphia, Thirty-second Annual Architectural Exhibition, Art Galleries of the Wanamaker Store, Philadelphia, Pa.
- Nov. 9-16, 1929.....First Southern Architectural and Industrial Arts Exposition, A. I. A. Regional Conference, and Semi-Annual Meeting of the Producers' Council, Municipal Auditorium, Memphis, Tenn.
- Nov. 13-16, 1929.....Seventh Annual Convention of the American Institute of Steel Construction, Inc., Edgewater Gulf Hotel, Biloxi-Gulfport, Miss.
- Dec. 4-6, 1929.....National Paving Brick Manufacturers' Association, 24th Annual Convention, The Palmer House, Chicago.
- Dec. 6-7, 1929.....Two Day Conference on church architecture under the auspices of the associated denominational bureaus and departments of architecture and architectural and manufacturers' displays, Statler Hotel, St. Louis, Mo.
- Jan. 11-18, 1930.....American Road Builders' Association, Annual Convention and Road Show, Atlantic City, N. J.
- Jan. 22-23, 1930.....Annual Business Meeting of the National Association of Real Estate Boards, Hotel Westward, Phoenix, Ariz.
- Jan. 27-31, 1930.....International Heating and Ventilating Exposition, under the auspices of the American Society of Heating and Ventilating Engineers, Commercial Museum, Philadelphia, Pa.
- Feb. 11-12, 1930.....American Concrete Institute, Annual Convention, Roosevelt Hotel, New Orleans, La.
- Feb. 20-22, 1930.....New England Hardware Convention and Exhibition, Mechanics Bldg. Headquarters Hotel Statler, Boston, Mass.
- March 24-28, 1930.....Building Officials' Conference of America, Annual Meeting, Cleveland, Ohio.

Wappat Company Name Changed

ANNOUNCEMENT has been made that the name of the Wappat Gear Works, Pittsburgh, Pa., which recently became a division of the Simonds Saw & Steel Company, has been changed. As the company's business developed, the design and manufacture of portable woodworking tools became the chief activity of this company and the gear business has become a thing of the past. The original name is now a misnomer. The company will, hereafter, be known as Wappat, Incorporated.

Enter Insulation Field

THE Chicago Mill & Lumber Corporation will, on November 1, inaugurate the production and distribution of insulating board. President Walter P. Paepke, in announcing the entry of the company into this field, stated that present plans call for an output of 250,000 square feet daily from the new plant at Greenville, Miss.

This New, Easy Blue Print Way Prepares You for These 9 Big Pay Jobs!



**Make
Up To \$12,000 A Year!**

HAVE you ever stopped to consider what stands between you and a big-pay job? Simply a lack of training on the "Headwork" side of Building and Contracting—that's all! The men who command the high-salaried positions know how to read blue prints—how to lay out and run jobs.

There is no reason why you, too, can't bridge this narrow gap between you and the jobs that pay up to \$12,000 a year. You need only to equip yourself with this essential knowledge to win a better position or a business of your own. With the Building Trades calling frantically for practical men who can read blue prints—with this training so easily available to you the Chicago Tech "Blue Print Way"—the opportunity is yours to take NOW!

Get This Big-Pay Training

The day when a tradesman could get practical "headwork" training only on the job is gone forever. The records of thousands of Chicago Tech graduates have proved that the idea is no longer true. That it's easy to learn how to read blue prints by the Builders' Course, the "Blue Print Way to Big Pay." This practical method is quick, easy and it's certain. You learn right

at home in your spare time with real blue prints and lessons as simple and easy to understand as a story book. Everything is explained in every day language and worked out by practical, experienced building experts. No text books. No grinding study. Simple as A. B. C.

Mastered In A Few Weeks

And the beauty of this wonderful course is that it teaches you plan reading in amazing short time. Yet this valuable knowledge is just what you need to equip yourself for one of the big indoor or outdoor jobs that yield \$4,800 to \$12,000 annually!

Of course, you want to win a "head work" job in one of the 9 big pay fields of building—to win the good things in life that big pay checks will bring. Take this positive, easy way to make your ambitions materialize. For you, too, can master this Blue Print Training that spells the success you have always dreamed about.

Simply mail the coupon at once. It brings a complete set of actual working blue prints and a valuable, instructive book, "How to Read Blue Prints"—free, absolutely FREE! Get these true facts before you as soon as possible. See what fun it will be to learn the fascinating "Blue Print Way." Know what wonderful opportunities await you in the seven billion dollar building field! Don't delay!

If You Live Nearby

Visit our big day or evening school attended by over 1,000 builders. You get this training at home by mail—same plans, lessons and instructions.

FREE

BLUE PRINTS AND BOOK!

We will send you absolutely FREE a full set of practical, working Blue Prints, also valuable book, "How to Read Blue Prints." We want you to see for yourself how easily and quickly you can now master blue print plan reading—the "Blue Print Way." Mail the coupon NOW—don't delay!



Chicago Technical School for Builders,
Dept. P-122, Chicago, Tech. Bldg.,
118 E. 26th St., Chicago, Ill.

Please send your Free Books and Blue Prints which I understand are mine to keep without obligation. It is also understood that no salesman will call on me.

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City..... State.....

**Chicago Technical
SCHOOL for BUILDERS**



Dept. P-122, 118 E. 26th St., Chicago, Ill.

Personnel Announcements

THE Duro Company, Dayton, Ohio, has recently announced the appointment of Frank H. Arnold, of Dayton, to the position of divisional sales manager for Wisconsin, Illinois, Indiana, Michigan and Ohio, with headquarters at Dayton.

A N announcement states that Hibbard S. Greene has been appointed assistant to the president of the Chain Belt Company, Milwaukee, Wis. He will co-ordinate the marketing plans of the Chain Belt Company, Sivyer Steel Casting Company, Federal Malleable Company and Interstate Drop Forge Company, all of Milwaukee, as well as the Stearns Conveyor Company of Cleveland.

THE De Walt Products Corporation, Leola, Pa., announces the addition to its organization of Walter Knapp as executive engineer of its plant.



Insulite and U. S. G. Affiliate

A RECENT announcement states that the Insulite Company, Minneapolis, Minn., and the United States Gypsum Company, Chicago, have become affiliated in the interest of greater economy and superior distributing facilities. Through the 40 mills and warehouses of the United States Gypsum Company, distributed throughout the country, and its 25 offices in principal cities, Insulite products will be sold and distributed in close co-operation with the Insulite Company's own offices and sales force.

The Insulite Company is expanding its International Falls plant and the addition will be in active operation early in 1930. The new developments will manufacture not only Insulite but new products, the offering of which will follow the completion of production units.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION,
ETC., REQUIRED BY THE ACT OF CONGRESS OF
AUGUST 24, 1912,

Of AMERICAN BUILDER, published monthly at Chicago, Illinois, for October 1, 1929.

State of New York }
County of New York } ss.

Before me, a Notary Public in and for the state and county aforesaid, personally appeared J. T. De Mott, who having been duly sworn according to law, deposes and says that he is the treasurer of the publisher of AMERICAN BUILDER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations printed on the reverse of this form to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, American Builder Pub. Corp., 105 W. Adams St., Chicago, Ill., and Simmons-Boardman Pub. Corp., 30 Church St., New York, N. Y. Editor, Bernard L. Johnson, 105 W. Adams St., Chicago, Ill.

2. That the owners are: American Builder Publishing Corp., 105 W. Adams St., Chicago, Ill. Stock owned by Simmons-Boardman Publishing Corp., 30 Church St., New York, N. Y. Stockholders of 1 per cent or more of the total amount of stock: I. R. Simmons, 1625 Ditmas Ave., Brooklyn, N. Y.; P. A. Lee, Hopatcong, N. J.; H. Anderson, 26 Rugby Rd., Brooklyn, N. Y.; E. G. Wright, 398 N. Walnut St., E. Orange, N. J.; Spencer Trask & Co., 25 Broad St., New York, N. Y.; S. O. Dunn, 105 W. Adams St., Chicago, Ill.; C. E. Dunn, 3500 Sheridan Blvd., Chicago, Ill.; B. L. Johnson, 105 W. Adams St., Chicago, Ill.; W. A. Radford, 105 W. Adams St., Chicago, Ill.; L. B. Sherman, 575 Sheridan Rd., Winnetka, Ill.; Mae E. Howson, 6922 Paxton Ave., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

J. T. De Mott, Treasurer.

Sworn to and subscribed before me this 30th day of September, 1929.

H. D. NELSON,

(My commission expires March 30, 1931.)

[SEAL.]

Hotter than Coal

--and no dirt



Do away forever with the drudgery of wood or coal. The most simple and economical invention on the market is now giving perfect satisfaction to enthusiastic users everywhere.

Burns 96% Air—4% Cheap Oil

The International Oil Burner fits in the fire box of your furnace or stove. Installed in a few minutes. No noisy motors or complicated parts.

Costs only a Few Dollars

Heats any stove or furnace just as well as a \$400 or \$500 oil burner without electricity or gas. Simply turn one valve and have all the heat you want. Cleaner and better for heating and cooking. Approved by engineers everywhere. Over 100,000 in use.

30 Days FREE Trial Offer

Try this wonderful International Oil Burner right in your own home at our risk. Act quickly and get our special low introductory price. Sold under absolute money-back guarantee.

Write at once for our free booklet on home heating and free burner offer.

Contractors—Dealers

Good reliable contractors are needed for dealers. Exclusive territory and dealer cooperation assure you of good steady profits. Write at once for complete dealer proposition.

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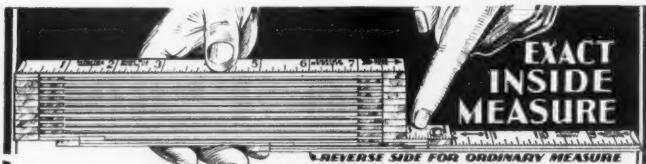
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Spring and Park Ave., St. Louis, Mo., Dept. N-38
Send your free booklet and free details on home heating for stove furnace Also free burner offer.

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For any measure—can be put to a 100 Uses. Slides out—locks rigid in use. More than twice as speedy as a folding rule. Made of selected boxwood.

Two Rules in One. One side specially designed for INSIDE MEASURING. Direct reading. No guesswork. Simple operation. Accurate results. Reverse side for Outside Measure, etc.

Buy a MASTER SLIDE RULE. Master users rarely change.

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IF NO DEALER NEAR YOU, SEND THE COUPON

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Please send us C. O. D. one MASTER SLIDE RULE as checked below:

6 foot size, \$1.20 8 foot size, \$1.60 5 foot size, \$1.00

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Address.....



WILL THE NAILS LAST AS LONG AS THE SHINGLES?

They will, if they are Reading Cut Shingle Nails. The life of a galvanized Reading Cut Nail is practically unlimited. Roofs in which these nails are used remain staunch, year after year—re-roofing is unnecessary until the shingles themselves weather away. And Reading Cut Nails, because of their wedge shape, have **more than twice** the holding power of ordinary wire nails!

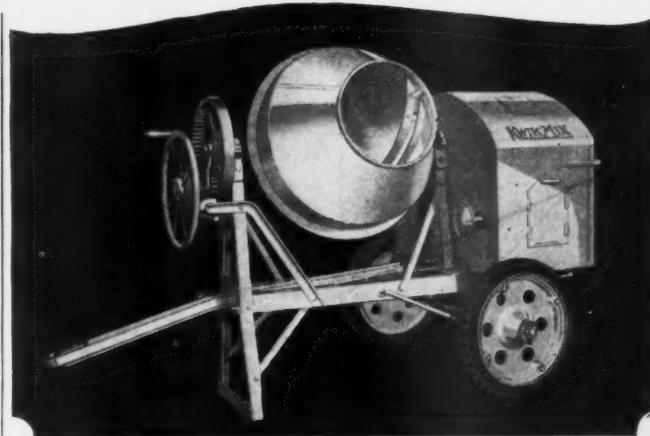
There are many sizes and varieties of Reading Cut Nails—a type for almost every building need. We'll be glad to send you our free illustrated catalog—write for it today.

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Baltimore	Detroit	Cleveland	Seattle
Boston	Houston	St. Louis	Philadelphia
Buffalo	Los Angeles	Tulsa	New Orleans
Chicago	New York	San Francisco	Kansas City

READING CUT NAILS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



NEW-Patented Tilting Device!

IT'S easy to tilt the Kwik-Mix drum—so easy, a boy can do it. The patented tilting device swiftly turns the loaded drum for discharging. And a twist of the wrist stops drum in any desired position.

The ALL-ROLLER BEARING Half-Bag Mixer with *counter-balanced drum, automatic drum return, quick-acting friction brake, adjustable stop, spring mounted axle and cushion tires*

—refinements that stamp the Kwik-Mix as the ideal all-around utilitymixer. Mail the coupon for the new Kwik-Mix Catalog No. 92.

*Note the convenient location
of handwheel and brake lever.*

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THE T. L. SMITH COMPANY, 1026-32nd St., Milwaukee, Wis.
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**THE
STRONGEST
GLUE
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Easy to Use—

Simply stir it in cold water.

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Mix it cold and use it cold on cold lumber. Eliminates the old fashioned messy glue-pot.

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A Casco glue joint is stronger than the wood itself. Tests 3800 lbs. per square inch on hard maple.

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Moisture or atmospheric changes do not affect Casco.

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One pound makes 1½ quarts of high-powered liquid glue and it spreads further.

Results—

Always uniform and unfailing on softwoods or hardwoods Casco holds on difficult gluing jobs when all other adhesives have failed.

Your sample package will prove that Casco is the most practical, durable, convenient and inexpensive glue you have ever used.

Fill out completely the coupon below and a generous trial package will be promptly forwarded postage prepaid.

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DEALERS—Send for Sales Plan and discounts.

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Enclosed find 25c (stamps only) to cover postage and handling cost
for which send me your trial package of Casco Waterproof Glue.

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OAK IS THE STANDARD OF
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No FLOORING can give home buyers a sense of sound, rich value so generously as Oak Flooring. Beautifully grained, warmly polished, an oak floor says to house buyers, "Here is a house in which all details have been as thoroughly cared for, as carefully constructed and as wisely provided for as this detail of flooring." They give prospects for your houses ideas of greater worth, more value. Oak floors help sell houses—and help sell them at better prices.

And Oak Flooring is comparatively inexpensive. It often costs less than carpets or manufactured flooring materials, and always very little more than floors of softer woods. And while your prospects can't help thinking of soft wood floors or of manufactured floor coverings as "cheap stuff," they always prize floors of oak. Oak Flooring raises the value of a house out of all proportion to its actual cost of installation.

If you have any flooring problems consult our technical staff for expert advice. Oak Flooring Manufacturers Association of the United States, 1238 Builders' Building, Chicago.

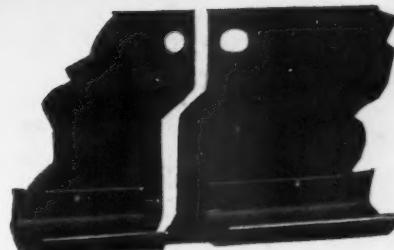
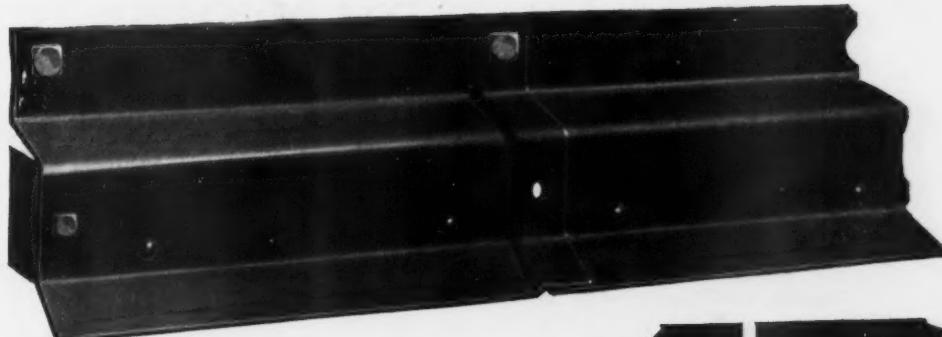
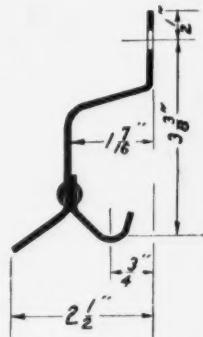
Oak Flooring advertising is being continued on an increased scale during 1929-30. Look for our advertisements in *House & Garden*, *House Beautiful*, *Good Housekeeping*, *Better Homes and Gardens*, *The Literary Digest*, *Ladies' Home Journal*, and *Small Home*.



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A Watershed Track for the Average Door-



"Shedwel" Track was designed to fill the demand for an economical watershed track for average and light weight doors.

"Shedwel" Track is in reality a small sized reproduction of "Glide"---the Track that for years has given complete satisfaction on thousands of large and heavy doors throughout the country. This new Track offers the same advantages of construction---the same positive weather protection and easy operation that has characterized "Glide" since the time the first installation was made.

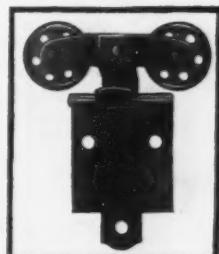
Write Dept. A-1229 for a copy of "How to Select the Correct Hanger and Track for Any Door" chart. It tells you how

to quickly diagnose the needs of and prescribe the right equipment for any size or weight door at a minimum cost. It is sent FREE on request. Frantz Manufacturing Co., Sterling, Ill.

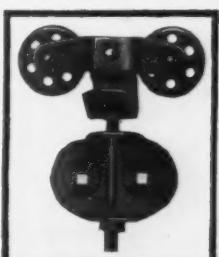


Note the patented telescoping joint that allows any number of lengths of "Shedwel" Track to operate as one continuous piece.

"Runwel" Hanger No. 12 is easily installed. Hinged drop strap allows door to swing out at bottom. Roller bearing wheels.



"Runwel" Hanger No. 14 provides easy adjustment for raising doors that wedge when floors raise or buildings sag. Roller bearing wheels.



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